Charles University in Prague

Faculty of Social Sciences

Institute of Economic Studies

MASTER'S THESIS

The impact of IMF financial aid on economic growth and inflation

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Declaration of Authorship

The author hereby declares that he compiled this thesis independently; using only the listed resources and literature, and the thesis has not been used to obtain a different or the same degree.

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Prague, December 10, 2016

Signature

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Abstract

The International Monetary Fund was created to promote financial stability, global monetary cooperation, high employment, international trade and sustainable economic growth. Together with the World Bank, IMF has a "monopoly" on offering loan programs for countries in deep crises or for development projects. In this thesis, we examine the effect of IMF, i.e. loan size and quotas, on the economic growth and inflation rate, by applying a dynamic panel regression on our dataset. In addition, we look at how the IMF Quotas influence the size of the loans. Our empirical results display significant evidence that IMF loans influence the GDP growth in a positive manner, in the medium term. Both Control of Corruption and Voice & Accountability have a negative influence on the economic growth. In other words, less corruption and stronger civil rights will halt the growth level of the economy. We also determined that IMF Quotas is not a robust indicator of the loan size. It is only driven by the past loan levels. Regarding Inflation determinants, IMF loans are not affecting the Inflation in a significant manner, while FDI and Control of Corruption - do. FDI exercises a positive influence on the CPI, while perception of less corruption has a negative effect on Inflation rate.

JEL Classification	D73, E31, F12, F21, F23, F32, F33, F34, F53, H81, O11, O16, O19
Keywords	IMF, Conditionality, Quotas, GDP, Inflation, Corruption, Voice & Accountability, FDI.

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Acronyms

IDA	International Development Association
IMF	International Monetary Fund
SDR	Special Drawing Rights
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
OECD	The Organisation for Economic Co-operation and Development
BRICS	Association of five major emerging national economies: Brazil, Russia, India, China and South Africa
GMM	Generalized Method of Moments model
RE	Random Effects model
FE	Fixed Effects model
OLS	Ordinary Least Squares model
SBA	Stand-by Arrangement
EFF	Extended Fund Facility
FCL	Flexible Credit Line
RCF	Rapid Credit Facility
SCF	Standby Credit Facility
CPI	Consumer Price Index
WGI	Worldwide Governance Indicators
WDI	World Development Indicators
GNI	Gross National Income
LIC	Low-income countries
VIF	Variance Inflation Factor
ADF	Augmented Dickey-Fuller test

Master's Thesis Proposal

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Notes: The proposal should be 2-3 pages long. Save it as "yoursurname_proposal.doc" and send it to mejstrik@fsv.cuni.cz, tomas.havranek@ies-prague.org, and zuzana.irsova@ies-prague.org. Subject of the e-mail must be: "JEM001 Proposal (Yoursurname)".

Proposed Topic:

The impact of IMF financial aid on economic growth and inflation

Motivation:

In 1973, IMF lost its primary purpose of protecting the system of exchange rates and international payments among advanced countries. Instead, it transformed into an organization, which provides loans to developing countries in crisis. Many countries have participated in loan programs of the International Monetary Fund. In fact, "almost all developing countries have received IMF financial support at least once since 1970" (Barro 2002, p. 2). Since the Global Financial crisis of 2007-2009, more countries have had troubles with their economies and demand in IMF loans has increased. In addition to that, we wonder if the IMF programs, including the controversial IMF Conditionality, have contributed in a positive way in obtaining sustainable economic growth.
Considering the broad reach and wide acceptance of IMF loans, it is important to know the consequences of these programs for economic growth and other dimensions of economic performance. Are IMF loan programs beneficial or would countries be better off if they did not engage in these kind of programs?

Hypotheses:

1. Hypothesis #1: IMF loans have a positive effect on growth of economic output of both Low and Middle Income countries;
2. Hypothesis #2: Countries with large IMF quotas will receive larger loans;
3. Hypothesis #3: IMF loans exercise an upward effect on the level of Inflation rate.

Methodology:

In this thesis, I will use World Bank and IMF financial data for the years 1970-2013. Our dataset will be a panel data. To analyse this type of data we will use the dynamic panel data model.

In test our first hypothesis, classification of countries into low and middle income was done based on the GNI data from World Bank. We will create two dummy variables for each income category and it will be included it in our regression models. Our dependent variable will be GDP growth. Among explanatory variables, we will use IMF loan size, FDI, Inflation rate, WGI variables.

For the second hypothesis, our model will be constructed based on the IMF quotas variable. We will determine a threshold for the large quota based on the 85th percentile of yearly quotas share. 85th percentile is based on IMF's 85% special majority of votes, needed to adopt an important decision. Our dependent variable will be IMF loan size. As explanatory variables, we will include IMF quotas, GDP growth, FDI, Inflation, WGI ranks.
Our third hypothesis argues that IMF loan programs are putting some pressure on the level of inflation. In this part of the thesis, we will test if the is any significant effect on the level of CPI. Our

dependent variable will be Inflation. Our model will include GDP growth, FDI, IMF loan size, WGI ranks and Low Income & Middle Income dummies, as explanatory variables.

Expected Contribution:

The most important papers that analyzed this topic are based on the data from the period between 1970-2006. This data does not cover the period of the Global financial crisis and the European sovereign debt crisis, which followed shortly. In this paper we will use recent data test if the effect of the IMF loans is consistent with other studies, which are focusing on this issue. We will also pay special attention on the Worldwide Governance Indicators and how significant is their effect on dependent variables.

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4. Epirical Results
5. Conclusion

Bibliography
Appendix A
Appendix B: Content of the enclosed DVD

Core Bibliography:

These are the most important papers that I am going to use:

1. DREHER, Axel. (2006). „IMF and Economic Growth: The Effects of Programs, Loans, and Compliance with Conditionality".
2. BARRO, Robert J. LEE, Jong-Wha. (2005). „IMF Programs: Who Is Chosen and What Are the Effects?".
3. BAS, Muhammet A. STONE, Randal W. (2013). „Adverse selection and growth under IMF programs".
4. EDWARDS, Kim. HSIEH, Wing. (2011). „Recent Changes in IMF Lending"
5. MIDTGAARD, Trude M. VADLAMANNATI, Krishna Chaitanya. DE SOYSA, Indra. (2013). „Does the IMF cause civil war? A comment".
6. ARABACI, Mehmet C. ECER, Sencer. (2014). "The International Monetary Fund (IMF) and the Catalytic Effect Do IMF Agreements Improve Access of Emerging Economies to International Financial Markets?"
7. DREHER, Axel. (2004). „Does the IMF cause moral hazard? A critical review of the evidence".
8. PRZEWORSKI, A., & VREELAND, J. R. (2000). „The effect of IMF programs on economic growth". Journal of development Economics, 62(2), 385-421.

Author **Supervisor**

1. Introduction

The International Monetary Fund was created as an organization that was meant to center its attention towards overseeing the international monetary system. Its initial objectives were to foster international monetary cooperation and exchange rate stability, facilitate growth of international trade and assist in fighting the balance of payments crisis, among others. Today, through its lending activity and so-called "IMF Conditionality", it is promoting financial stability, global monetary cooperation, high employment, international trade and sustainable economic growth. IMF strives toward its mission using three approaches: monitoring economic and financial activity of its member countries, "technical assistance" and training in drafting policies, and lending. The last one of the three approaches will be under close examination in this thesis, where we will test if it can actually bring an increased economic growth. The International Monetary Fund, together with the World Bank, can be considered "monopolies" on providing financing in case of crisis or for development projects. An alternative source of financing came into existence in July 2014, when BRICS countries signed a declaration to establish the New Development Bank. The decision to create this bank was motivated both by the lack of reform in IMF's quotas and voting rights, as well as by the "Washington Consensus"[1] policies, which were criticized for the "one size fits all" policy approach (Stiglitz 2004). These economic policies were encouraged as "universal cure for the economic troubles" by institutions based in Washington D.C. such as US Treasury Department, the International Monetary Fund and the World Bank. "Washington Consensus" policy prescriptions are at the base of the IMF Conditionality. As Joseph Stiglitz (2004)[2] observed, these policy prescriptions were seeing the government as the problem and efficient markets as the solution. In their study of IMF programs,

[1] Washington Consensus is a term, seen as synonymous with "globalization", which was coined by John Williamson - an English economist in 1989.

[2] Stiglitz concluded that the only consensus in these policy prescriptions are two underlying problems: "excessive belief in market fundamentalism; and international economic institutions which have created unfair rules of the game and which have foisted the failed policies, particularly on developing countries which are dependent on them and donors for assistance."

Barro & Lee (2005) applied a different approach to analyze the Fund's influence. They modeled it as a political organization and found that Fund's loan programs are inclined to be more frequent and larger when a country has a bigger quota and more professionals employed in the organization. In this paper, we will operate with the latest available data in analyzing if IMF's quotas effect on economic output has changed in some way during the last nine years.

During the Global Financial Crisis, the GDP of highly industrialized countries fell abruptly over a prolonged time, although the extent of gross domestic product loss did not match the one suffered in the Great Depression. Many developed nations suffered from exposure to the U.S. subprime market, which caused a slowdown of global industrial production and high unemployment. Developing countries were also impacted, above all, by the outflow of capital and reduction in trade. Recovery proved to be at a slow pace and longer than expected, due to lack of trust in financial institutions and households overloaded with debt, among others reasons. To contain the situation and prevent a larger economic downturn, governments of major advanced economies applied a series of traditional measures, as fiscal stimulus and expansionary monetary policy; as well as non-traditional ones, as the bailout of systemically important financial institutions and devaluation of national currency. This macroeconomic context triggered an increase in demand of funds from IMF, especially for the countries who could not afford paying from their own pockets to fix the economy.

Considering the lack of alternative financing sources and the extensive reach of IMF's programs, it is important to know the ramifications of these loans on the economic growth and economic performance indicators, in general. Numerous studies found that loans provided by International Monetary Fund are reducing the economic output of borrower countries (Dreher, 2006; Barro & Lee, 2005; Hutchison, 2003; Przeworski & Vreeland, 2000). Theoretically, this international organization can influence economic activity through its policy advisory, lending and conditionality attached to the money. In the process of finding an answer on whether the countries will benefit from entering a loan agreement with IMF, we have to take into account the direction of causality. Hence, we need to be able to distinguish

between the effect of the preexisting economic context and the effects from the loan program. An appropriate approach for capturing these effects is the system GMM estimator, which was created to analyze the effect of lagged explanatory variables. In this thesis, we took an additional step in identifying the initial economic context. We included two dummy variables: one for countries in the Low Income and one for countries in the Middle Income category, according to classification methodology from the World Bank. In this way, we are able to analyze the effects for each income category. In addition to that, we included non-economic parameters, which are also representing the initial economic context within a state. These are variables from the World Governance Indicators (a World Bank project), which are capturing different dimensions of governance in a country. The use of these parameters in our study is motivated by the importance of governance in shaping laws and policies. From available empirical evidence, troubles created by the lack of governance are often spreading and are "contaminating" the economic system. According to a study of Kaufmann & Kraay (2002),[3] "when the institutions of the state are "captured" by vested interests in this way, entrenched elites in a country can benefit from a worsening status quo of misgovernance and can successfully resist demands for change even as incomes rise". He referred to the rise in economic output, without a strengthening of governance. It motivated the author of this thesis to include the *Control of Corruption* variable in this paper and test if corruption can be a cause of economic downturns.

In the next section, we will describe the characteristics of the IMF loan implementation. It also includes a short summary of the literature on significance of the Fund's loan programs on the GDP growth and a discussion about channels of influence of IMF on economic growth. Section 3 presents the methodology and models used in this thesis, as well as the data description. In Section 4, we will outline our empirical results, while section 5 concludes.

[3] Kaufmann & Kraay (2002) Growth Without Governance

2. Characteristics of the IMF

After the disruption of the international monetary cooperation, which led to the Great Depression of the 1930s, 44 countries decided to found an institution that would focus on overseeing the international monetary system, i.e. “the system of exchange rates and international payments that enables countries (and their citizens) to transact with each other” (IMF 2014, IMF at a Glance, p. 1). The new international entity would warrant exchange rate stability and strengthen its member countries to eliminate exchange restrictions that crippled trade. The IMF was conceived close to the end of World War II, during the Bretton Woods Conference in July 1944, as a specialized agency of the United Nations. Since its creation, it has become an almost universal financial institution.

The number of members in the International Monetary Fund rose from 44 states to 189 at present. Any country that accepts the statutes of the organisation and conducts foreign policy can become a member. Nevertheless, the members of the IMF do not have an equal number of votes in the decision making process of the organization (Bordo and James, 2000). Each member contributes a quota subscription to the Fund. When joining the IMF, a country usually pays 25 percent of its quota in the form of SDRs and 75 percent in its own currency. Voting power of each country in the organisation is determined by the size of its quotas: “each member has 250 basic votes plus one additional vote for each SDR one hundred thousand of quota” (Bordo and James 2000, p. 5). Founding members determined their starting quotas at the Bretton Woods Conference in 1944, when the IMF was planned. National income and external trade volume were used as inputs in the quotas allocation model. The same principles were applied for the new members of the organisation. According to its charter, IMF should correct the general quotas every five years, in order to take into account changes in economic power of the member countries (IMF 2014, Quotas). Half of all the general reviews since 1950 resulted in an increase of the quotas size (Bordo and James, 2000).

The International Monetary Fund is accountable to the governments of its member countries. Its organisational structure consists of Board of Governors, Executive Board, Independent Evaluation Office and several departments and committees. The most important decision making body of the Fund is the Board of Governors, which is composed of one Governor and one Alternate Governor from each member country. The Board of Governors has ordinary meetings once a year, during the IMF-World Bank Annual Meetings (IMF 2014, IMF at a Glance). A big part of the decision-making is done by the IMF's Executive Board, which has 24 directors that oversee the day-to-day work of the Fund. Five directors are appointed by the largest five shareholders - the United States (42,122 million SDRs or 16.75% of the total IMF quotas), Japan (6.23%), Germany (5.81%), France (4.29%), the United Kingdom (4.29%) (IMF – Annual Report 2014: Appendix VI, p. 28). The other directors are elected by nineteen groupings of the remaining countries. In 2010, an Amendment of the IMF's Articles of Agreement was agreed. It was supposed to introduce an Executive Board, whose members are all elected. The Managing Director is in charge of the activity of the Executive Board and it is also the head of the IMF staff. Executive Board Chairman is assisted by four Deputy Managing Directors (IMF 2014, IMF at a Glance).

IMF's decisions are strongly influenced by the major shareholders. Voting process is done according to the size of a country's quota in the Fund. Some important decisions are approved only with special voting majorities of 85 percent (Bordo and James, 2000). Thus, theoretically, USA together with a group of three Western European countries could have veto power. The managing director of the Fund has traditionally been a European. However, this fact did not stop the United States from exerting the strongest voice at the IMF. There were cases when it openly used this power to influence decisions (Kahler 1992 and Stone 2002).

IMF's staff consists of 2,119 professional and managerial staff and 459 staff at the support level, according to the IMF Annual Report 2014 (IMF 2014, Chapter 5, p. 65). And half of the total employees are economists.

Today, the IMF has evolved into an organisation that has enough power to influence the development of the world economy. According to its original purposes, that were

formulated at Bretton Woods in 1944, and others that were added later, IMF's functions include the following:

1. „Surveillance" function aimed at "promoting world trade, and securing the general well-being of the world economy, through analysis and advice" (Bordo and James 2000, p. 6). It relates to organisation of a "machinery for consultation and collaboration on international monetary problems" (Bordo and James 2000, p. 6). Poor designed policies have a detrimental effect that, in some cases, can extend country borders. This is the reason why IMF is driven to influence the policies of its members. Surveillance function takes two main forms. First form is multilateral and it is based on a general study of the relationship between national economic policies and performance of the economy. It also includes forecasts based on a variety of scenarios (Bordo and James, 2000). This analysis is materialized in the form of a publication, called World Economic Outlook. IMF economists also work on reviews of the global capital markets, which are published as the International Capital Markets Reports (IMF, 2014). These two publications are highly respected. Their econometric models are considered very advanced. Second form is the bilateral surveillance, based on regular dialogue with member countries, which are known as Article IV consultations. These consultations are done on an annual basis (after a period in which they were less frequent). Some critics dismiss these reports on member countries as insufficiently derogatory. Primarily, because of the good relations with officials and ministers that develop over time (Bordo and James, 2000). This important function of the International Monetary Fund accounts for a significant part of the budget.
2. Providing credits to member countries – so called „drawings on the Fund" in IMF terminology. Credit is traditionally provided in tranches and is conditional on the policy reforms required, the so-called conditionality. Usually the size of the tranches is set to 25% of a member's quota. The first tranche, usually, is available without any discussion of policy (Bordo and James, 2000). In reality, to understand what are the sources of the IMF loan programs one needs to grasp the current state of international currency

markets. This is because, essentially, the Fund cannot distribute all the resources that constitute the quota. Using quotas, paid in national currency, for the purpose of support operations, either by a developing country or by a large emerging economy, can provoke a problem for that country. Hence, the Fund has strict limits in lending out the quotas paid in by its members with rich economies (Bordo and James 2000).

3. Provider of subsidized credit – depends on the circumstances. In the 1970's, the IMF has begun financing poor economies by giving them low interest credits. These countries were affected by increased cost of fuel, which they were importing. Initially, this "interest subsidy" was financed by the sale of some units of Funds gold reserves (Bordo and James 2000, p. 10). Thus, IMF's facilities for low-income countries were created and are known as Enhanced Structural Adjustment Facility. These subsidized loans are given on a basis of per capita income and only if the country is eligible for World Bank's concessional crediting under International Development Association. Today, one part of the subsidy is financed from interest from a Trust Fund started in the 1970's. The second part of the subsidy consists of donations and loans from rich member countries.
4. Another function that IMF undertook is creating supplementary reserves, in the form of a "currency" called SDR (Special Drawing Right). It is not a currency per se. Instead, it represents a reserve asset based on a basket of four international currencies—the euro, Japanese yen, pound sterling, and U.S. dollar - and held by IMF member countries (IMF 2014, Special Drawing Rights). It was created (according to the first Amendment of the Articles of Agreement) in case of a need for liquidity and to be used as a unit of account for the member country reserves. Nevertheless, because capital markets are generally liquid this requirement proved to be worthless. And as a result, there has been no issue of SDRs since the 1970's. This means that the more recent members have not received allocation of SDRs. As a result, currently the SDR does not have a very important role in world monetary policy (Bordo and James 2000).

5. Data collection - which is disclosed in a standardized way in International Financial Statistics publication. Publishing the results and their availability to a wider public proved that surveillance can be more effective. The World Economic Outlook material is published as well. The IMF also publishes reports on international capital markets (Bordo and James 2000).
6. Training and technical assistance – provided by the IMF Institute to member countries. It delivers helpful information and "know-how" on issues like central bank and Finance Ministries operation, fiscal policy and tax regulation etc. (Bordo and James 2000).

Thus, the IMF has now transformed into the "crisis manager" and "development financier" for developing economies (Barro and Lee 2003, p. 7).

2.1. Main lending facilities

One of the first lending facilities IMF implemented is Stand-by Arrangement (SBA). It was motivated by the need of credit to solve their balance of payments issues. This was the reason Stand-By Arrangement (SBA) was created in June 1952. It is the most used lending instrument for emerging market countries. Although the rates for this lending facility are lower than private markets rates, they are considered non-concessional. The typical Stand-By Arrangement covers a period of 12-24 months, but no more than 36 months, with repayments scheduled between 3 and a quarter and 5 years from the date of the borrowing (IMF 2014, Lending).

The Extended Fund Facility (EFF) is also used to help countries overcome balance of payments difficulties. It is designed to address complicated structural problems that usually may take more time to redress than macroeconomic imbalances. Under this type of program the IMF focuses on comprehensive actions to improve the processes of the markets and institutions, privatization of state-owned enterprises and reforming fiscal and financial sectors. This facility was introduced in 1974. The EFF arrangements are approved for periods up to 3 years, with a repayment period of 4.5 to 10 years, in twelve semi-annual instalments (IMF 2014, Lending).

Extended Fund Facility (EFF) together with Stand-by Arrangements (SBA) are the main IMF programs, created to provide financial assistance to handle the balance of payments problems of the member countries in the short term. These programs are not supposed to cover low-income countries.

The Flexible Credit Line (FCL) was created for trusted governments that are known for their good records of policy enactment. It represents a very different approach in how the IMF provides financial assistance to member countries. This is because, under this facility, the Fund is not imposing limits on the loan size and no ongoing conditions. The FCL is a credit line that can be renewed and countries have the right to extract funds from a credit line at any time within a previously agreed period. This period could be for either one or two years, with the condition that after the first year the eligibility is evaluated. Once a country is declared eligible (according to criteria agreed from the start) it can obtain all the available credit without any conditionality or tranches, contrary to the other IMF lending programs. Repayment should take place over a 3¼ to 5 year period (IMF 2014, Lending).

The Precautionary and Liquidity Line (PLL) is created to flexibly meet the liquidity needs of countries with healthy economic fundamentals but with some limited vulnerabilities which makes impossible for them to use the Flexible Credit Line (FCL). This lending instrument "is intended to serve as insurance and help resolve crises" (IMF 2014, Lending). PLL arrangements are for a period of either six months or one to two years. A six-months PLL program can be renewed only after a two years of "cooling-off period" from the date of approval of the previous six-month PLL arrangement (IMF 2014, Lending).

The Rapid Financing Instrument (RFI) provides fast and low-access credit to economies that need to solve urgent balance of payments problems, without the requirements needed for a full-blown program. It's a product of an expansive reform whose goal was to bring a more flexible financial support from IMF. RFI can provide assistance to meet a wide range of urgent issues, including "commodity price shocks, natural disasters, post-conflict situations and emergencies resulting from fragility" (IMF 2014, Rapid Financing Instrument). The level of access depends on the balance of payments needs. Financial support allocated under this program has similar terms

as the Stand-By Arrangements (SBA), the Flexible Credit Line (FCL) and Precautionary and Liquidity Line (PLL). RFI should be repaid within a period of 3¼ to 5 years (IMF 2014, Lending).

The Trade Integration Mechanism (TIM) was created in April 2004 to help member countries to meet balance of payments deficits that might be caused by the newly implemented trade liberalization measures. This is not a special lending facility. It looks more like a policy designed to make resources more predictably available under existing IMF lending facilities (IMF 2014, Lending).

To help low-income countries to overcome the severe shock caused by the Great Recession, the IMF has updated its facilities that were giving concessional loans and made them more flexible. In this way these lending instruments could meet increasing demand for financial assistance from countries that craved them. These changes became effective in January 2010. As a part of the new Poverty Reduction and Growth Trust (PRGT) were established three loan types: the Standby Credit Facility (SCF), the Extended Credit Facility (ECF) and the Rapid Credit Facility (RCF). The interest rate levels for all concessional facilities under the PRGT are reviewed by the Fund every two years. The next modifications made to interest rates should take place in the end of 2014 (IMF 2014, Lending).

The Extended Credit Facility (ECF) provides credit to member countries with extensive balance of payments issues. The ECF took the place of the Poverty Reduction and Growth Facility (PRGF), which was introduced in 1999. It was created as a part of a broad reform started in 2010. Initially it was under the Poverty Reduction and Growth Trust (PRGT) facility and later it became the Fund's main instrument for providing medium-term support to low income countries (LICs). ECF has "higher levels of access, more concessional financing terms, more flexible program design features, as well as streamlined and more focused conditionality" (IMF 2014, Lending). Its main goal is to make the country to become a stable and sustainable economy, which implies growth and poverty reduction policies. Financing under the ECF carries a zero interest rate till the end of 2014, with a grace period of 5½ years, and a final maturity of 10 years (IMF 2014, Lending).

The Rapid Credit Facility (RCF) represents a facility with rapid financial assistance, which has less conditionality, made available to low-income countries (LICs) that are dealing with urgent balance of payments problems. The RCF incorporates the Fund's emergency financing, provides significantly lower lending costs, can be used in a broad range of situations, and focuses mainly on the countries objectives of growth and poverty reduction. It provides financial support to LICs and does not require usual IMF program conditionality. It can be used for a wide variety of situations like economic shocks or natural disasters. This program also includes support for policy implementation and can provide help to attract foreign aid. As in the case of Extended Credit Facility, financing cost under the RCF has a zero interest rate through 2014, a maturity of 10 years and a grace period of 5½ years (IMF 2014, Lending).

The Standby Credit Facility (SCF) provides financing to member countries with low GDP with short-term balance of payments difficulties. It's helpful under a wide range of problems, charges a low interest rate and can be used as precautionary measures. SCF program also puts a lot of effort in fulfilling growth and poverty reduction objectives. This lending tool supports LICs that suffer from short-term shocks and financing problems, even if they have reached a sustainable macroeconomic position. To be eligible country's credit and adjustment needs are usually "expected to be resolved within two years" (IMF 2014, Standby Credit Facility). An arrangement under SCF program can range from 12 to 24 months. Because it is planned to cover short-term needs, it is restricted to two and a half for each five years. A loan under the Standby Credit Facility carries a 0.25% interest rate, but is subject to exceptional deduction of all interest payments on concessional loans due to the IMF through the end of 2014. The grace period for SCF is 4 years and final maturity is 8 years. It also stipulates an availability fee of 0.15% p.a. on the unused portion of the available credit during each six-month period (IMF 2014, Lending).

Barro and Lee (2003) consider that these activities should be described as foreign aid and not as loan or adjustment programs. These financing instruments brought the IMF into what had traditionally been the World Bank's area of concern (IMF 2014).

2.2. IMF conditionality

IMF conditionality, in its broad definition, includes the adjustments made to the economic policies of a country in exchange for financial assistance provided by the Fund. The amount of resources provided by the IMF loan programs are made available in quarterly instalments and are conditional on the performance of the policy benchmarks and results of the implemented reforms (Barro and Lee 2003).

When a country enters into a borrowing arrangement with the IMF, its government should be ready to improve its economic policies in order to solve the problems that made the government seek financial aid. These program conditions also serve to guarantee that the member country will be able to repay back the loan received from the Fund. Loan reforms implemented in 2010 modernized IMF conditionality so it will allow to encourage "national ownership of strong and effective policies" (IMF 2014, Conditionality).

The concept of Conditionality in a broad sense includes both the characteristics of IMF programs (macroeconomic and structural policies) and special instruments for monitoring progress to achieve the goals set by the country. Conditionality is used to solve balance of payments issues without applying measures that are adverse to national or international prosperity. At the same time, these measures are meant to ensure that IMF resources will be repaid by the borrower and that the country's economy will be strong enough to permit it. All conditions stated under an IMF arrangement must be crucial for reaching the macroeconomic goals (IMF 2014, Conditionality).

The member country, that has entered a financing agreement with the IMF, has primary responsibility for selection, design, and implementation of the reforms that will allow the goals of the program to be achieved. The program is initiated with a letter of intent that should be supplemented with a "memorandum of economic and financial policies" (IMF 2014, Conditionality). The country's technicalities are dictating the goals of the program and policies required to be implemented. But, the underlying goal is fixing the balance of payments problems and reaching macroeconomic stability, while creating conditions for sustained, high-quality growth

and for reducing poverty, in the case of low-income countries (IMF 2014, Conditionality).

In recent years, the Fund has become more flexible in how it operates and communicates with member countries on issues like structural reform of their economies. Conditionality ground rules were revised in 2002 after an extensive review. In March 2009, the IMF started a comprehensive reform to improve its ability to prevent and resolve crises, which allowed it to further modernize its conditionality structure. The new operational instructions indicate that conditions should be designed and focused according to countries' different policies and economic context. Moreover, structural reforms are covered by analysis of broad program performance (IMF 2014, Conditionality).

2.3. Economic growth and IMF programs

Since the 1970s, the IMF ''placed increasing emphasis on economic growth as a policy objective. Growth became increasingly prominent as an objective in the 1980s'' (Hardoy 2003). Since then, Managing Directors of the Fund, Michael Camdessus and Horst Kohler, further emphasized the IMF's role in economic growth (Hardoy, 2003).

A huge number of studies focused on the subject whether the IMF undeniably influences economic growth (Bird, 2001). Three methods of evaluation have been used. The so-called before–after analysis looks at economic growth before the IMF program has been agreed and the growth levels after the program has concluded. Differences in value are then considered a result of the program. Obviously, this method is not perfect, because participation in IMF programs is usually the consequence of a crisis. Fund's effects are probably judged too negatively, when referring all changes in growth over the program period to the IMF (Dreher, 2006).

Another method employed was to compare growth rates in countries participating in the program with the growth of countries in a control group ("with–without approach" (Dreher 2006, p. 4)). External shocks affecting both groups of countries would not bias the results. The main problem with this approach, of course, is finding

a proper control group of countries. Theoretically, we should consider a control-group country for each program country analysed. Loan programs are not randomly distributed over member countries, but are selected from countries with certain characteristics (Dreher 2006). As Santaella (1996) has observed, the initial position of program countries is significantly different from non-program countries. This method could not consider the most important characteristic - the decision to participate in an IMF program in the first place, even if the control group would be selected based on such criteria as economic indicators. However, according to Atoyan and Conway (2005), this approach could work and countries could be matched according to the probability of being under a program.

The third method consists of a regression analysis - used by most recent studies. In this approach, we take into account the endogeneity of the IMF-related variables. Moreover, it appears to be the best method, considering the type of data used. However, to solve the endogeneity problem is not a simple task. Most of the earlier studies have not put a lot of effort in solving this problem. More recent studies, like Przeworski and Vreeland (2000) or Barro & Lee (2005), consider this problem. In 2006, Axel Dreher published a paper, which is the only one that adequately separates the effects of the advice provided by IMF and compliance with conditionality from financial support allocated. Even though the paper of Hutchison and Noy (2003), could match a part of the compliance with conditionality effect and negative stimulus due to increased budgetary leeway.

In our thesis, we will use the third approach to identify the connectivity between the economic output, inflation and IMF loan programs.

2.4. How can the IMF influence the economic growth

International Monetary Fund has a multitude of channels to influence economic outcomes. First channel is the program approval, which is clearly associated with a particular amount of funds. This credit does not have a very clear impact. In theory, IMF financial support is supposed to help fix the economy. However, in practice the result might be exactly opposite: loan received from the IMF increases governments' time to come up with a solution to the crisis, thus it creates a false feeling that

problem was solved and, in the end, it reduces the incentive to reform (Boockmann and Dreher 2003). As a consequence to this fact, governments carry on with inappropriate policies longer than they would in different circumstances (Bandow, 1994). According to a study by Veiga (2005), participation in IMF loan programs during high inflation periods reduces the probability of stabilization, while the effect of credit allocated is ambiguous and depends on the timing of disbursements.

Another path of affecting growth is the case when availability of Fund's loan may negatively affect economic policy even before credit has been allocated. Moral hazard hypothesis states that IMF lending may be understood as a subsidized income insurance against shocks that could harm the economy (Vaubel 1983). „The insurance" cover encourages the potential receivers of funds to not bother with preventive measures against such problems. We can find a considerable amount of evidence that the balance of payments problems of borrowers from the IMF have been largely of their own creation and that economic benchmark results during inter-program years have been declining as the number of past programs increased. In his paper, Evrensel (2002) shows that budget deficits, inflation rates, and domestic credit are higher in the second inter-program period compared with the first. Conway (1994) claims that participation in IMF programs is more likely to happen again the more frequently the country had participated in the past. Dreher and Vaubel (2004a) showed that economic policy is undeniably more expansive in countries with higher IMF loans available, when compared with the country's undrawn quota with the Fund. If the hypothesis that IMF induces moral hazard and bad economic policy is true, then the effect of all this would be the reduced growth (Dreher 2006).

Third, the IMF imposes conditionality to its loan programs. These conditions contain methods and instruments, which are believed to be adequate to achieve sustainable growth and solve the crisis. Nevertheless, we hear frequent complaints addressed to IMF conditionality, which is described as "one size fits all" and inappropriate in most cases (Bird 1986, Feldstein 1998 and Meltzer 2005). If these statements are true, then enforcement of those conditions could reduce growth. In addition, non-compliance with conditionality and program interruptions are frequent. If Fund's conditions are

not implemented and programs interrupted, then certainly, they could not possibly have any impact on the performance of the economy (Dreher 2006).

A fourth way of the Fund to influence growth is its advisory regarding policy implementation or the so-called „technical assistance" (Boockmann and Dreher 2003). IMF's recommendations are often publicly discussed and may have a long run effect in influencing politics (Killick 1994, p. 156). Fischer (2001) argues that one of the IMF's main added value to reforms is that it is constantly promoting a particular way to economic policymaking. Thus, in the long term the IMF's impact can reach farther than recent effects of conditions and finance. Therefore, Fund's advice to policymakers can have a positive effect on growth regardless of policy conditionality (Dreher 2006).

3. Methodology

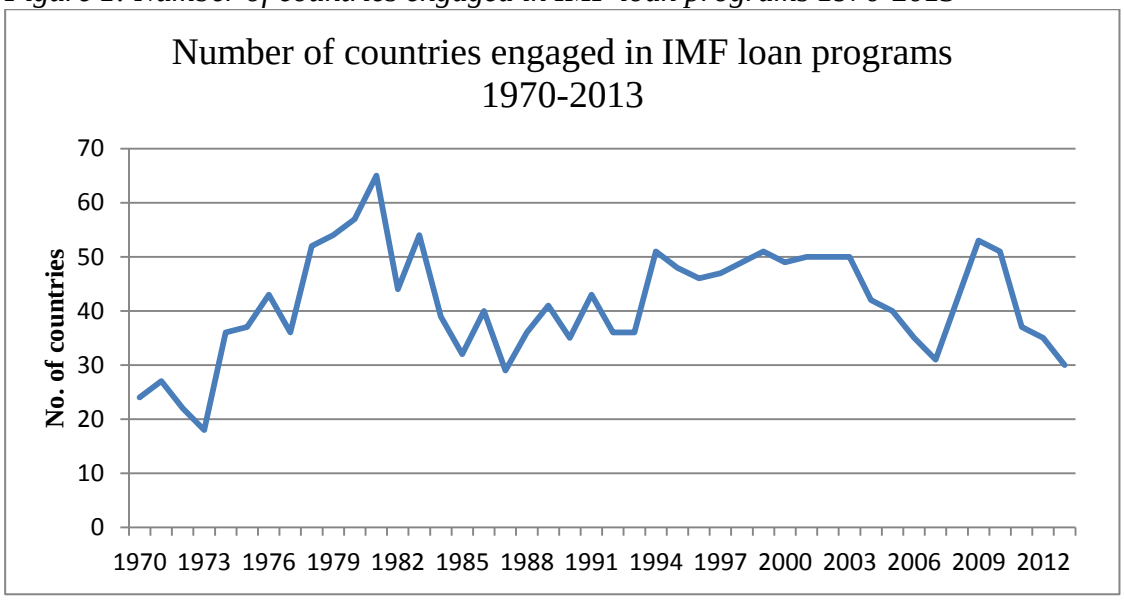
This chapter consists of three sections. In the first part, we formulate our hypotheses regarding the interaction between parameters chosen in the dataset. In the second section, we provide a brief description of the panel dataset, together with an explanation for each variable included in it. In the last part of the chapter, we will introduce our analytical models and describe how we will apply them in this thesis.

3.1. Hypotheses

Given the characteristics of the International Monetary Fund, which we described earlier, we focused our analysis on how loan programs affect two of the most important economic benchmarks – GDP growth and Inflation rate. In addition, to shed some light over the problem regarding influence of major shareholders during the decision-making process, we will have a look at how the IMF Quotas are affecting the access of member countries to larger funds.

Inspired by the persistent attention on economic growth since the moment organization was founded back in the ‘70s of the XX century (Hardoy 2003), we want to add a fresh view on how the Fund’s programs influenced the growth rate of GDP. Therefore, our first point of discussion will be the influence exercised by the amounts drawn from the General Resources Account of the International Monetary Fund on the rate of economic growth. The recent global financial crisis caused quite some shock and put to a test the robustness of national economies. It significantly increased the “demand” for IMF’s loans during 2006 and 2009. Thus, we have more data to be included in our thesis, as you can see in the figure below.

Figure 1: Number of countries engaged in IMF loan programs 1970-2013



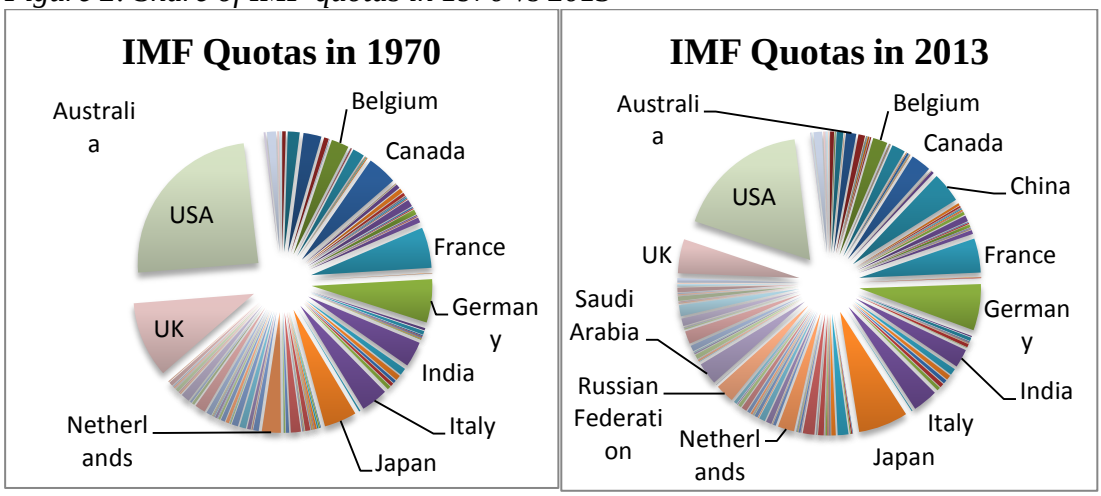
Source: Author's calculation based on data from World Bank

Our assumption here is that Fund's programs create a positive stimulus for countries in the low-income category, by offering the chance to implement reforms at a very low cost of financing.[4] When it comes to countries in the middle-income group, we expect that the effect on the growth rate of GDP will be less positive, assuming Solow's Law of Diminishing Returns is relevant in this case.

In light of results of previous studies (Barro & Lee, 2005), which argue that countries with larger share of IMF's Quotas tend to receive more sizable loans, we decided to factor in the more recent data and replicate the analysis using a system GMM estimator. In this part of the thesis, our discussion will focus on whether a bigger share in the International Monetary Fund can lead to larger loans. As we can see in *Figure 2*, the membership structure of the Fund has changed quite significantly since 1970. The share of countries like USA, UK, France, Belgium, Australia and Canada has decreased, while countries like China, Russia and Saudi Arabia have expanded their Quotas contribution.

[4] When compared with other sources of financing, like banking system or international financial markets.

Figure 2: Share of IMF quotas in 1970 vs 2013



Source: Author's elaboration based on data from World Bank

In the last part of our analysis, we will have a look on the level of Consumer Price Index and how it reacts to IMF loans. Factors driving the CPI level, up or down, vary for each country. Some countries rely heavily on imports of consumer products, while others are driven by the public sector activity (with government spending being the main factor sustaining economic activity, and subsequently the level of inflation). In moments of crisis, Inflation level is one of the "barometers" used to signal problems arising within an economy. It is an indicator that can go either way. For this reason, we will try to identify if engaging in a loan program from IMF can affect the level of prices. Our assumption is that it has an upward effect on the level of consumer prices.

This being said we proceed to describe our data.

3.2. Data description

The data sample we use is an unbalanced panel of 186 countries that covers the time span from 1970 to 2013, represented in a long format.[5] For some countries or periods, we have missing observations. The number of observations is based on our choice of instruments selected.

[5] In the long format, each row is one time point per subject. Therefore, each subject (country) will have data in multiple rows. Any variables that do not change across time will have the same value in all the rows.

The full list of countries selected for this study is stated in *Appendix C: Data Diagnostics*. The initial list of 214 countries, available in the data bank, was reduced due to low number of observations. The original set consists of observations with annual periodicity, while the dataset used has a five-year periodicity (nine time-periods) for each variable. We are using them in order to be able to distinguish between the long and short term effects of explanatory variables. The data sources for the observations employed in this thesis are World Bank's "World Development Indicators" and "Worldwide Governance Indicators" databases. Most of the instruments, included in the set, are taken from the mentioned sources, while the author calculated the others. After a first glance at the dataset, we can identify a series of missing observations in the time span 1970-1990 for the "Eastern Bloc" countries, with a few exceptions.

We categorize our dataset into three groups: indicators of Macroeconomic environment, Governance indicators and dummy variables for income and quotas classification. First group includes standard macroeconomic variables as *GDP growth rate*, *GDP per capita*, *Inflation*, *FDI*; together with *IMF loan size*, *IMF quotas* and a dummy for countries with *Large IMF quotas*. To calibrate the effect of the population and economy size, that might distort the results in some cases (like China, India or USA), we adjusted our variables by dividing them by GDP or midyear population.

- *GDP growth rate*

GDP growth rate is the main instrument for measuring the performance of an economy. According to World Bank data, this variable is defined as the annual percentage growth rate of GDP based on constant local currency. When adjusted for the size of population, this variable can represent the increase of the standard of living in a country. It is aggregated based on constant 2005 U.S. dollars.

- *GDP per capita*

This variable represents a ratio that measures the average income per person in a country. It is also used as a proxy of standard of living. According to the definition from World Bank, GDP is the sum of all gross value added by all resident producers in the economy, together with taxes on products, minus subsidies that were not

included in the value of the products. GDP per capita is calculated by dividing the gross domestic product by midyear population of the country. Data is represented in current US dollars (for the year 2014). In our econometric analysis, we will use a logarithmic transformation of this instrument in order to make our data (that spreads over different orders of magnitude) more symmetrical.

- *Inflation rate*

Inflation is measured by Consumer Price Index, an instrument that measures the average changes in prices paid for consumer goods and services over time. Inflation is also reflecting the rate of decrease (or increase) of the purchasing power of a currency. It is generally agreed that in the long run, inflation is caused by increases in the monetary supply (Trichet, 2004). This variable is represented in annual percentage. According to the World Bank, Inflation rate in our dataset was aggregated using Laspeyres formula.

- *FDI–GDP ratio*

Foreign Direct Investment instrument included in our dataset shows net inflows in the economy of selected countries from foreign investors, as a percentage of GDP. It measures the inflow of investment to get hold of at least 10% of the voting stock in a local business. As stated in OECD's Benchmark Definition of Foreign Direct Investment (2008), this variable is often used to represent the level of attractiveness of an economy and competitiveness if its enterprises when compared with other countries. Therefore, it should show the level of a country's economic integration within the global market. For this reason, we included it in our study.

- *IMF Loan-GDP ratio*

This is a variable created by the author based on World Bank data. It is expressed as a ratio of IMF purchases on the GDP. The reason behind it is to control for the size of the economy. Both GDP and IMF purchases are expressed in current (2014) US dollars. According to World Data Bank description, "IMF purchases are total drawings on the General Resources Account of the IMF during the year specified, excluding drawings in the reserve tranche".

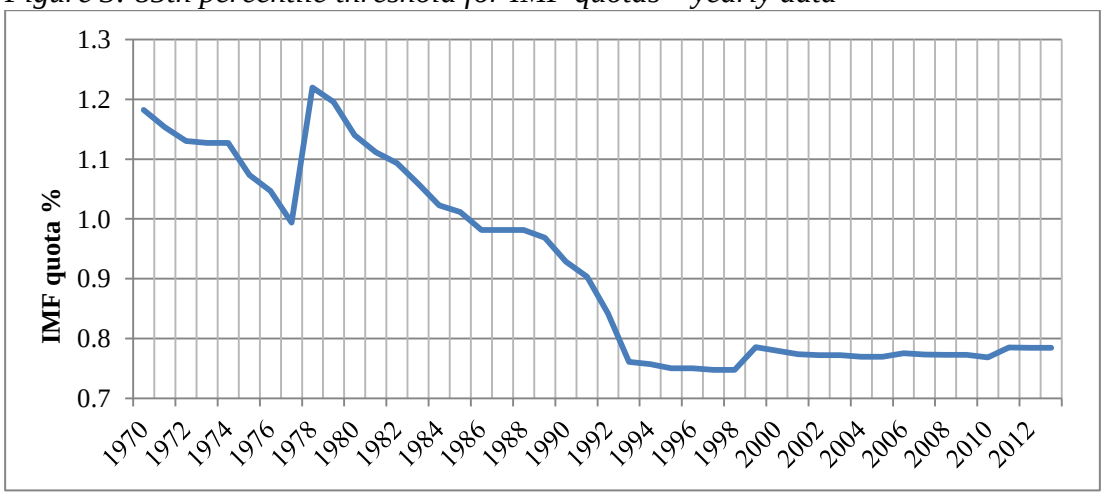
- *IMF Quotas*

IMF quotas is a variable that represents the share of SDR allocated to a country as a percentage of total amount of SDR. A certain quota is attributed to each country that joins IMF. It is calculated based on a formula, which takes into account economic size and other characteristics of a member (like openness and economic variability). Used as an independent variable IMF Quotas will help us measure the effect on the dependent resulted from a single unit change in it. In other words, we can measure the change in *GDP growth rate* if the quota increases by 1 percentage point, ceteris paribus.

- *Large quotas dummy*

One of the key functions of IMF Quotas, we would like to focus on, is the voting power. As IMF explained, IMF quotas determines the voting power of a member country. Therefore, we want to measure the influence of the members with large quotas. This is a dummy variable that was calculated based on the IMF quotas indicator. We determined the 85th percentile value for each period (1 year and 5 year periods) as a threshold between large and small quotas, and the countries with a quota equal or larger than the threshold have a Large Quotas value equal to one. Observations for countries with small quotas are equal to zero. We chose 85th percentile as a boundary on the grounds that, at the IMF, important decisions are approved with a special majority of 85% of the votes.

Figure 3: 85th percentile threshold for IMF quotas – yearly data



Source: Author's calculation based on data from World Bank

Second group of variables consists of the following indicators from the World Bank's Worldwide Governance Indicators database: Control of Corruption, Government Effectiveness, Rule of Law and Voice & Accountability. These instruments are represented as estimates, with values from -2.5 to 2.5. According to World Bank, these estimates exhibit the country's result on the aggregate indicator.

- *Control of Corruption*

According to World Bank, Control of Corruption captures perceptions of the magnitude to which public power is used for private gain, starting from light form of corruption and ending with the so-called "state capture" by private interests (Kaufmann 2010). Lower values, closer to -2.5, indicate a higher level of perceived corruption. While a high estimate, closer to 2.5, denotes a lower level of perceived corruption.

- *Government Effectiveness*

According to the World Bank, "Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies" (Kaufmann 2010). A higher value of this indicator, closer to 2.5, is denoting a higher quality of services provided by the government.

- *Rule of Law*

Rule of Law is capturing the degree of confidence in and acceptance of the society rules, enforced by the government and its representatives (Kaufmann, 2010). Like for the other two indicators in this series, a higher value will suggest a higher confidence in the existing legislative system and the way the law is applied.

- *Voice & Accountability*

We included Voice & Accountability indicator as a proxy for democratic freedoms and civil rights. It is the best representation of the people's perception regarding the ability to participate in elections, as well as freedom of association, freedom of

expression, and a free mass media (Kaufmann 2010). It is also represented as an estimate, as the other instruments in this group. A higher value of the estimate (closer to 2.5) represents a perception of a stronger enforcement of civil rights in the country.

The third group is composed of the following dummy variables: *Low Income*, *Middle Income* and *High Income*. These indicators, created by the author based on World Bank's panel data on income level of economies, are equal to one if the country belongs to that income level; and zero otherwise. Assigning countries based on the level of income is done based on GNI per capita indicator, which is calculated using the World Bank's Atlas Method (World Bank Data: Country and Lending Groups). According to the data on GNI per capita for 2013, countries with a GNI per capita of $1 045 or less, are considered Low Income countries, while High Income are those with a per capita income more than $12 746. All the other countries are in the Middle Income category. In our regressions, we will include only the *Low* and *Middle Income* indicators to avoid the situation of having a perfect multicollinearity. Another reason why we are deliberately dropping the High Income dummy is that, along the history of IMF programs, there were not many cases of loans provided to high-income economies.

Table 1: Summary statistics of variables- full dataset

VARIABLES	(1) No. of obs.	(2) Mean	(3) Std. Dev.	(4) Min.	(5) Max
Country	1674	93.5	53.70884	1	186
Time	1674	5	2.58276	1	9
GDP growth	1467	3.759595	4.46805	-42.4511	56.69554
Ln(GDP per cap)	1471	7.663661	1.624375	4.160078	11.94554
Inflation	1250	35.10739	258.0291	-5.53127	6424.988
FDI-GDP ratio	1336	3.297604	6.141583	-17.5077	132.0772
Loan-GDP ratio	917	0.004603	0.010672	0	0.210228
Quotas	1420	0.629705	1.867381	0.000774	23.79395
Large quotas	1674	0.125448	0.331325	0	1
Contr. of Corruption	733	-0.018	0.99221	-1.9785	2.51277
Voice & Account.	744	-0.02275	0.981966	-2.19359	1.711144
Gov. Effectiveness	733	-0.01821	0.975082	-1.92796	2.252287
Rule of Law	744	-0.03371	0.976631	-2.17072	1.961363
Low Income	1674	0.391876	0.488315	0	1
Middle Income	1674	0.452808	0.497917	0	1
High Income	1674	0.155317	0.362315	0	1

Notes: This table represents the summary statistics for all variables included in the dataset. Country indicator represents the 186 countries included in the dataset. Time represents the 9 time periods of 5-year average: 1970-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-1999, 2000-2004, 2005-2009, 2010-2013.

When checking if our data is stationary we can choose from a wide range of tests, like Levin-Lin-Chu (2002), Harris-Tzavalis (1999), Breitung test (2000), Im-Pesaran-Shin (2003), Fisher-type test (Choi 2001) of Augmented Dickey Fuller (ADF) and Hadri Lagrange Multiplier test (2000) (Stata manual: xtunitroot). Our choice fell on Fisher-type ADF test, seeing as it can be used in case of unbalanced panels, as is our case. The null hypothesis for this test is presence of unit root in all panels, hence the variable is not stationary.

When testing our full sample (see results in *Table 14* in *Appendix C*) we identified several non-stationary variables: *Ln(GDP per. cap.*), *FDI-GDP ratio*, *Large Quotas*, *Low Income* and *Middle Income*. Their p-value of Inverse Normal statistic (Z) is higher that 0.05, hence we cannot reject the null hypothesis. The rest of the regressors are stationary at a 5% level of statistical significance. We transform our *Foreign Direct Investment* regressor using natural logarithm, which makes it stationary, as you can see in table below. *Ln(GDP per. cap.)* variable will be droped as it is higly correlated[6] with other two regressors, as we will demonstrate below. Regarding our other instruments with unit root, transforming will not make them stationary.

[6] One possible explanation is Spurious correlation, since correlated variables are also non-stationary. Our theory is confirmed after we include a drift term in ADF, which makes them stationary.

Table 2: Testing for Unit Root using Fisher test (with lag 0) - reduced sample

VARIABLES	(1) No. of panels	(2) Avg no. of periods	(3) Z	(4) Z: p-value
GDP growth	186	7.89	-20.793	0.0000
Ln(GDP per cap)	185	7.95	3.027	0.9988
Inflation	173	7.23	-19.283	0.0000
Ln(Inflation)	173	7.15	-5.210	0.0000
Ln(FDI-GDP ratio)	181	7.07	-9.163	0.0000
Loan-GDP ratio	117	7.84	-9.61	0.0000
Ln(Loan-GDP ratio)	108	5.30	-5.564	0.0000
Quotas	179	7.93	-18.924	0.0000
Large quotas	186	9	-0.137	0.4456
Contr. of Corruption	184	3.98	-15.489	0.0000
Voice & Account.	186	4	-16.507	0.0000
Gov. Effectiveness	184	3.98	-8.213	0.0000
Rule of Law	186	4	-10.558	0.0000
Low Income	186	9	3.100	0.9990
Middle Income	186	9	3.866	0.9999

Notes: This table represents the output from the Unit Root testing using Fisher-type ADF. Results from testing the full dataset is represented in Table 14 in Appendix C. As we described above, some variables were transformed in order to make them stationary: natural logarithm was applied to FDI-GDP ratio; while other instruments were dropped: Government Effectiveness, Rule of Law, High Income dummy, Ln(GDP per cap).

During the pre-estimation stage, we tested the correlation (see *Appendix E: Correlation matrix*) between our variables and we discovered that we have several cases of strong correlation in our set. First, we notice the strong correlation of *Ln(GDP per. cap.)* with the Worldwide Governance Indicators: *Control of Corruption* (correlation coefficient 0.7718), *Government Effectiveness* (0.8181), *Rule of Law* (0.7855) and *Voice & Accountability* (0.6437). This instrument also has a strong negative correlation with *Low Income* dummy variable (correlation coefficient -0.79). Second, *Middle Income* and *Low Income* dummies are highly correlated with each other (-0.7302). Third, our Worldwide Governance Indicators are highly correlated between themselves: *Control of Corruption* with *Government Effectiveness* (0.9371), with *Rule of Law* (0.9349), with *Voice & Accountability* (0.7668); *Government Effectiveness* with *Rule of Law* (0.9304) and with *Voice & Accountability* (0.7748); and, ultimately, *Rule of Law* with *Voice & Accountability* (0.8293).

When testing for collinearity, using *Collin* command in Stata, we detected the presence of multicollinearity between our variables (see *Table 15* and *Table 16* in *Appendix C: Data Diagnostics*). Our preliminary regression trials, using Arellano-Bover/Blundell-Bond method, showed that *Low Income* dummy variable is dropped because of collinearity. We suspect that this regressor, together with *Middle Income*, form a perfect linear combination. We are not able to replace them due to lack of instruments, which can be a substitute. Therefore, we will run two separate regressions where we will analyze the effect of IMF programs on countries, which are part of these two income categories. We also decided to drop *GDP per capita* indicator, due to detected correlation with other instruments and its insignificance at a 95% confidence level. High correlation between the WGI explanatory variables forced us to drop two of them, with the highest VIF: *Government Effectiveness* and *Rule of Law*. A high VIF value of these two could imply that they are redundant, in combination with *Contr. of Corruption* and *Voice & Accountability*. Our assumption seems to be true when we look at collinearity diagnostics results after reducing our data set (see *Table 3* and *Table 4*), with Mean VIF value closer to one.[7] Nonetheless, we still have correlation present between *Contr. of Corruption* and *Voice & Accountability*, fact confirmed by the high VIF level. Our solution to fix this problem is to include these variables separately in our regressions. We detect a similar problem with *Quotas* and *Large quotas*, when we look at the Correlation matrix from Stata (*Appendix E: Correlation matrix*) - these indicators are strongly correlated. The high VIF values for these two instruments confirm this fact. Therefore, we will drop the *Large quotas* variable.

[7] According to Kutner (2004), a Mean Variance Inflation Factor larger than one is a sign of strong multicollinearity.

Table 3: Collinearity Diagnostics – reduced dataset (incl. Middle Income)

Variable	VIF	SQRT VIF	Tolerance	R- Squared
Inflation	1.03	1.01	0.9736	0.0264
Ln(FDI-GDP ratio)	1.09	1.04	0.9159	0.0841
Loan-GDP ratio	1.05	1.02	0.9543	0.0457
Quotas	3.05	1.75	0.3279	0.6721
Large quotas	2.95	1.72	0.3385	0.6615
Contr. of Corruption	1.93	1.39	0.518	0.482
Voice & Account.	1.94	1.39	0.5165	0.4835
Middle Income	1.39	1.18	0.7203	0.2797
Mean VIF	1.8			

Notes: Variance Inflation Factor, or VIF, measures the degree of inflation of variance of the estimated coefficients as compared to the case when variables are not linearly related (Kutner, 2005). A VIF value larger than 10 is an indicator of multicollinearity. In addition to that, Squared VIF reveals the degree of ”inflation” of the standard error for the instrument’s coefficient, compared to the event when the variable were not correlated with another one, in the data set.

Table 4: Collinearity Diagnostics – reduced dataset (incl. Low Income)

Variable	VIF	SQRT VIF	Tolerance	R- Squared
Inflation	1.03	1.01	0.9736	0.0264
Ln(FDI-GDP ratio)	1.09	1.04	0.9159	0.0841
Loan-GDP ratio	1.05	1.02	0.9543	0.0457
Quotas	3.05	1.75	0.3279	0.6721
Large quotas	2.95	1.72	0.3385	0.6615
Contr. of Corruption	1.93	1.39	0.518	0.482
Voice & Account.	1.94	1.39	0.5165	0.4835
Low Income	1.39	1.18	0.7203	0.2797
Mean VIF	1.8			

Notes: Variance Inflation Factor, or VIF, measures the degree of inflation of variance of the estimated coefficients as compared to the case when variables are not linearly related (Kutner, 2005). A VIF value larger than 10 is an indicator of multicollinearity. In addition to that, Squared VIF reveals the degree of ”inflation” of the standard error for the instrument’s coefficient, compared to the event when the variable were not correlated with another one, in the data set.

The following table stipulates the list of all variables included in our empirical analysis, including the operated transformation.

Table 5: Variable's short description, transformation and source

Variable	Description	Transformation operated for stationarity	Source
Inflation	Consumer Price Index five-year average data, which reflects the percentage change in the cost of buying goods.	Stationary	World Bank
FDI- GDP ratio	Foreign Direct Investment five-year average data, which reflects direct investment equity flows, as a percentage of GDP.	Logarithmic transformation	World Bank
Loan- GDP ratio	Five-year average data, which reflects IMF purchases as a percentage of GDP of the country.	Stationary	Author's calculation based on WB data
Quotas	IMF Quota share for each country represented in five-year average data.	Stationary (if used separately from Large quotas dummy)	IMF
Large Quotas	Dummy variable for countries with a quota larger than 85th percentile of IMF Quota share.	Stationary (if used separately from Quotas)	Author's calculation
Contr. of Corruption	Control of Corruption indicator represented as five-year average estimate	Stationary (if used separately from Voice & Account.)	World Bank
Voice & Account.	Voice and Accountability indicator represented as five-year average estimate	Stationary (if used separately from Contr. of Corruption)	World Bank
Middle Income	Dummy variable for countries with a GNI per capita between $1045 and $12746	Stationary (if used separately from Low Inc dummy)	Author's calculation
Low Income	Dummy variable for countries with a GNI per capita lower than $1045.	Stationary (if used separately from Middle Inc dummy	Author's calculation

As we already mentioned, we applied logarithmic transformation to *Foreign Direct Investment* instrument in order to make it stationary. Other than that, the remaining variables are already stationary.

3.3. Analytical Model

As we already mentioned above, we use a panel data set. This type of data has significant advantage over cross-section or time-series data when we are trying to learn about economic processes. Panel data analysis allows us to study these processes while taking into consideration both the dynamic effects (which are not detectable in cross sections) as well as the heterogeneity across countries. Therefore, we need a more complicated model to achieve consistent and efficient estimators.

The most commonly used techniques for regression analysis with longitudinal data are the following: Pooled regression, the Fixed Effects model and the Random Effects model. To determine which method is appropriate to be used in our regression, we take into consideration their underlying assumptions and specifics.

According to Greene (2012), the fundamental modelling framework for this type of data has the following form

$$y_{it} = x'_{it}\beta + z'_{i}\alpha + \varepsilon_{it} \tag{3.1}$$

$$= x'_{it}\beta + c_i + \varepsilon_{it} \tag{3.2}$$

where x_{it} consists of K regressors and does not include a constant term. $z'_{i}\alpha$ captures the heterogeneity, where z_i includes a constant term and a group of variables which may be either observed or unobserved. If we have an observed z_i for all countries in the dataset, then our model can be considered a linear model and we can use OLS. Otherwise, when z_i is unobserved, we have to use different methods of regression. We have to take into account that in most cases the individual effect is unobserved, and using OLS will lead to inconsistency of the coefficients due to the disregard of the time and individual difference between observations. Hence, Pooled Regression model does not fit our data well enough. Greene (2012) also suggests that a consistent and efficient estimation depends on our correct understanding of the assumptions about the unobserved effects. One of them is the strict exogeneity assumption for the explanatory variables, which in other words means that disturbances should be uncorrelated with independent variables in every period.

$$E[\varepsilon_{it}|x_{i1}, x_{i2}, \dots, x_{in}] = 0 \quad (3.3)$$

Another assumption deals with heterogeneity, i.e. mean independence assumption. It asserts that unobserved effects should not be correlated with other explanatory variables included in the regression.

$$E[c_i|x_{i1}, x_{i2}, \dots, x_{in}] = \alpha \quad (3.4)$$

This assumption is the basis for the random effects model.

As we already mentioned Population Averaged model cannot be used to yield consistent and efficient estimators. OLS estimates will be inconsistent due to heterogeneity that varies across countries. The problem of this approach is the fact that underlying assumptions for OLS are less likely to be fulfilled. First differences method is another approach that can be used. According to Greene (2012), an advantage of this method is that it removes the latent heterogeneity. A big disadvantage, except that it eliminates time-invariant instruments, is that this approach is suitable only for two-period panels.

The Fixed Effects model originates from the assumption that the omitted effects, c_i, in the general model (3.2) are correlated with the included variables:

$$E[c_i|X_i] = h(X_i) \quad (3.5)$$

Even though we can identify some group-specific effects, this model has a major issue: we cannot estimate the coefficients for the time-invariant terms. It is because these variables are absorbed in the constant term.

Random Effects model is used in the scenario when the unobserved effects, z_i, are uncorrelated with variables already in the model. According to Greene (2012), this approach is relevant only if cross-sectional units are selected from a large population. The same source states that, while this model is in a considerable way reducing the estimated parameters, there is a chance that estimators will prove inconsistent, if our assumption is incorrect.

Therefore, we chose to use a dynamic model to analyze our panel data set, namely Arellano-Bover/Blundell-Bond dynamic panel estimators. According to Roodman (2009), the estimator was created for ”situations with: a) “small T, large N” panels, meaning few time periods and many individuals; b) a linear functional relationship; c) one left-hand-side variable that is dynamic, depending on its own past realizations; d) independent variables that are not strictly exogenous, meaning they are correlated with past and possibly current realizations of the error; e) fixed individual effects; and f) heteroskedasticity and autocorrelation within individuals but not across them”. The Arellano–Bover/Blundell–Bond (AB/BB) uses GMM and transforms all regressors, by method of differentiation. When compared to Arellano Bover (1995), AB/BB estimator is allowing one extra assumption: the first differences of the explanatory variables are uncorrelated with the fixed effects. This assumption grants us more efficiency by introducing more variables in our regression model.

If we rewrite our general model, as specified in equation (3.2), as a dynamic panel data model, it will have the following structure

$$y_{it} = x'_{it}\beta + \delta y_{i,t-1} + c_i + \varepsilon_{it} \tag{3.6}$$

The underlying assumptions of this model are:

a) Homoscedasticity: $E[\varepsilon_{it}^2 | X_i, c_i] = \sigma_\varepsilon^2$
b) Strict exogeneity: $E[\varepsilon_{it} | X_i, c_i] = 0$
c) Non-Autocorrelation: $E[\varepsilon_{it}\varepsilon_{is} | X_i, c_i] = 0$ if $t \neq s$
d) Uncorrelated observations: $E\left[\varepsilon_{it}\varepsilon_{js} | X_i, c_i, X_j, c_j\right] = 0$ for $i \neq j$ and for all t and s,

where the rows of the T × K data matrix X_i are x'_{it}, according to Greene (2012).

In the following sections, we will describe our regression models in detail, based on the hypotheses we want to test. These models are based on some of the previous papers published on the same topic (Barro & Lee, 2005; Dreher, 2006). We restricted the number of variables, previously used in the mentioned papers, and included new instruments, like *Contr. of Corruption*, *Voice & Accountability*, *Government Effectiveness*, *Large Quotas*, *Low* and *Middle Income*.

3.3.1. Low and Middle Income countries and the effect of the IMF loan programs

The first hypothesis we want to test in our study is whether there is a negative or positive effect of IMF loan programs on the economic growth of countries over the period from 1970 to 2013. We will focus on the Low and Middle Income countries. A majority of the studies on this topic have stated that, overall, the growth rates are decreasing after engaging in an IMF loan program.

Our assumption for the *Low Income* countries is that engagement in a Fund's loan program is affecting the GDP growth in a positive way. We base our assumption on the Law of Diminishing returns and Poverty Trap theory (*Figure 4* in *Appendix D*) conditional on whether these countries will succeed in realizing "the Big Push" and escape "the Poverty Trap". For *Middle Income* countries, we assume that Fund's loans will also have a positive effect on the growth of the gross domestic product, but smaller than the one for *Low Income* borrowers. As a possible explanation can be either the insufficient loan amount to "push" the economy to a new equilibrium or the lack of a "High income equilibrium".

In addition to the *Loan-GDP ratio*, we include *IMF Quotas* variable in order to capture the effect of the voting power exercised by a member country within the Fund.[8] Our assumption is that a larger quota will trigger a lower rate of economic growth, since a large quota translates into resources allocated to IMF instead of being invested back into the national economy.

A fact to be noted here is that for *Quotas, Contr. of Corruption, Voice & Accountability, Low Income* and *Middle Income* we will not include their first lag in our models, because the fitted coefficients of these variables and their lags are highly correlated, as we noticed in our initial regression analysis.

For testing our hypothesis, we will use the following models:

[8] According to Barro &Lee (2005), IMF Quotas are not always adjusted to the level of GDP. His OLS regression of IMF Quotas on the total GDP and per capita GDP has identified that there are countries over-weighted on quotas, like Russia, UK and France; and countries under-weighted on quotas, like South Korea and China.

(1) $Ygrowth_{it} = \alpha_i + \beta_1 Ygrowth_{it-1} + \beta_2 Infl_{it} + \beta_3 Infl_{it-1} + \beta_4 Ln(FDI/GDP)_{it} + \beta_5 Ln(FDI/GDP)_{it-1} + \beta_6 Loan/GDP_{it} + \beta_7 Loan/GDP_{it-1} + \beta_8 Quotas_{it} + \beta_9 Crptn_{it} + \beta_{10} LowI_{it} + \varepsilon_{it}$

(2) $Ygrowth_{it} = \alpha_i + \beta_1 Ygrowth_{it-1} + \beta_2 Infl_{it} + \beta_3 Infl_{it-1} + \beta_4 Ln(FDI/GDP)_{it} + \beta_5 Ln(FDI/GDP)_{it-1} + \beta_6 Loan/GDP_{it} + \beta_7 Loan/GDP_{it-1} + \beta_8 Quotas_{it} + \beta_9 V\&A_{it} + \beta_{10} LowI_{it} + \varepsilon_{it}$

(3) $Ygrowth_{it} = \alpha_i + \beta_1 Ygrowth_{it-1} + \beta_2 Infl_{it} + \beta_3 Infl_{it-1} + \beta_4 Ln(FDI/GDP)_{it} + \beta_5 Ln(FDI/GDP)_{it-1} + \beta_6 Loan/GDP_{it} + \beta_7 Loan/GDP_{it-1} + \beta_8 Quotas_{it} + \beta_9 Crptn_{it} + \beta_{10} MiddleI_{it} + \varepsilon_{it}$

(4) $Ygrowth_{it} = \alpha_i + \beta_1 Ygrowth_{it-1} + \beta_2 Infl_{it} + \beta_3 Infl_{it-1} + \beta_4 Ln(FDI/GDP)_{it} + \beta_5 Ln(FDI/GDP)_{it-1} + \beta_6 Loan/GDP_{it} + \beta_7 Loan/GDP_{it-1} + \beta_8 Quotas_{it} + \beta_9 V\&A_{it} + \beta_{10} MiddleI_{it} + \varepsilon_{it}$

3.3.2. Country's quota at IMF and loan size

Another question that we want to find an answer to is whether the size of a country's quota can affect Fund's decisions. We wonder if a country can exercise its influence in tipping the scale in favor or against granting a larger amount of financial aid.

Edwards (2001) states that influence, represented by member's quotas, reduced the probability of loan program suspension. According to Barro & Lee (2005), "IMF loans are more likely to exist and to be larger in size when countries have larger quotas, more nationals on the IMF staff, and are more connected politically and economically to the United States and the major Western European countries". We expect the same effect in our results. Our analysis will take into consideration the effect of the quotas on the loan amount drawn from IMF.

In this part of our analysis, together with our instruments we will add their first lags, except for *Quotas, Contr. of Corruption* and *Voice & Accountability*. These three variables are strongly correlated with their first lags, according to our preliminary regression analysis. We also noticed that initially our models were misspecified, which indicated that we need to rethink our model. Hence, we replaced the dependent variable with its natural logarithm. Our regression models will have the following form:

(1) $Ln(Loan/GDP_{it}) = \alpha_i + \beta_1 Ygrowth_{it} + \beta_2 Ygrowth_{it-1} + \beta_3 Infl_{it} + \beta_4 Infl_{it-1} + \beta_5 Ln(FDI/GDP)_{it} + \beta_6 Ln(FDI/GDP)_{it-1} + \beta_7 Ln(Loan/GDP_{it-1}) + \beta_8 Quotas_{it} + \beta_9 Crptn_{it} + \varepsilon_{it}$

(2) $Ln(Loan/GDP_{it}) = \alpha_i + \beta_1 Ygrowth_{it} + \beta_2 Ygrowth_{it-1} + \beta_3 Infl_{it} + \beta_4 Infl_{it-1} + \beta_5 Ln(FDI/GDP)_{it} + \beta_6 Ln(FDI/GDP)_{it-1} + \beta_7 Ln(Loan/GDP_{it-1}) + \beta_8 Quotas_{it} + \beta_9 V\&A_{it} + \varepsilon_{it}$

3.3.3. IMF loan programs and their effect on Inflation level

In this part of our thesis, we will have a look on the influence of IMF's programs on the rate of Inflation. Our assumption is that Funds' financial aid is providing an additional upward pressure on the level of prices and leads to currency crises, which, subsequently, has a negative effect on the consumers by increasing the price of imports and debt denominated in foreign currency.[9] Joyce, J. P. (2004), argues that our evidence of a systematic effect on inflation is insufficient. On the other hand, Steinwand and Stone (2008), state that "credible IMF programs can lower inflation levels". Therefore, using the available data, we will test if the IMF loans are raising the inflation level.

As in Section 3.3.1, our regression models will not include first lag for the following variables: *Quotas, Contr. of Corruption, Voice & Accountability, Low Income* and *Middle Income*. This is also caused by the correlation between the fitted coefficients of variables and their lags.

Our initial regression trials were showing us that our models are misspecified, which indicates that we need to rethink our model. Hence, we will use the natural logarithm of Inflation as dependent variable. Furthermore, in our models, we include only *GDP growth*, without its first lag, in order to ensure that overidentifying moment conditions are valid, which will allow us to obtain consistent estimates.

We use the following four models:

[9] According to a study by Axel Dreher and Stefanie Walter (2010) on effect of IMF loans on the likelihood and outcome of currency crises.

(1) $$Ln(Infl_{it}) = \alpha_i + \beta_1 Ygrowth_{it} + \beta_2 Ln(Infl_{it-1}) + \beta_3 Ln(FDI/GDP)_{it} + \beta_4 Ln(FDI/GDP)_{it-1} + \beta_5 Loan/GDP_{it} + \beta_6 Loan/GDP_{it-1} + \beta_7 Quotas_{it} + \beta_8 LowI_{it} + \beta_9 Crptn_{it} + \varepsilon_{it}$$

(2) $$Ln(Infl_{it}) = \alpha_i + \beta_1 Ygrowth_{it} + \beta_2 Ln(Infl_{it-1}) + \beta_3 Ln(FDI/GDP)_{it} + \beta_4 Ln(FDI/GDP)_{it-1} + \beta_5 Loan/GDP_{it} + \beta_6 Loan/GDP_{it-1} + \beta_7 Quotas_{it} + \beta_8 LowI_{it} + \beta_9 V\&A_{it} + \varepsilon_{it}$$

(3) $$Ln(Infl_{it}) = \alpha_i + \beta_1 Ygrowth_{it} + \beta_2 Ln(Infl_{it-1}) + \beta_3 Ln(FDI/GDP)_{it} + \beta_4 Ln(FDI/GDP)_{it-1} + \beta_5 Loan/GDP_{it} + \beta_6 Loan/GDP_{it-1} + \beta_7 Quotas_{it} + \beta_8 MiddleInc_{it} + \beta_9 Crptn_{it} + \varepsilon_{it}$$

(4) $$Ln(Infl_{it}) = \alpha_i + \beta_1 Ygrowth_{it} + \beta_2 Ln(Infl_{it-1}) + \beta_3 Ln(FDI/GDP)_{it} + \beta_4 Ln(FDI/GDP)_{it-1} + \beta_5 Loan/GDP_{it} + \beta_6 Loan/GDP_{it-1} + \beta_7 Quotas_{it} + \beta_8 MiddleInc_{it} + \beta_9 V\&A_{it} + \varepsilon_{it}$$

4. Empirical Results

Before running a regression using a dynamic panel data model, we employ a few simple panel data models (pooled OLS, Random Effect and Fixed Effect models) in order to get a first glimpse of our dataset. The results are presented in *Table 6*. The purpose of this exercise is to understand how our instruments behave under such restrictive assumptions, particularly for OLS, versus more relaxed ones, for FE and RE.

Table 6: Regression results for pooled OLS, FE and RE on GDP growth

Variable	OLS	FE	RE
Inflation	-0.0008	-0.0318**	-0.0013
	(0.002)	(0.016)	(0.002)
Ln(FDI-GDP ratio)	0.5711***	0.8561***	0.5855***
	(0.122)	(0.249)	(0.132)
Loan-GDP ratio	4.7869	10.8107	2.4472
	(10.778)	(13.645)	(10.162)
Quotas	1.1654***	1.0269	1.0712***
	(0.306)	(2.552)	(0.389)
Contr. of Corruption	-0.1807	0.3273	-0.3395
	(0.276)	(0.885)	(0.321)
Low Income	1.0137***	0.0747	0.6152*
	(0.306)	(0.565)	(0.337)
_cons	2.9989***	3.6106***	3.1210***
	(0.267)	(0.765)	(0.317)
chi2			27.558
df			
No. of Obs.	423	310	423

Notes: The dependent variable is GDP growth rate over the 5-year periods 1970-1974, 1975-1979, …, 2010-2013. The p-value is reported at a 95% confidence level, where: * p<0.1; ** p<0.05; *** p<0.01. The chi2 represents the Chi-Square statistic, which shows the number of predictors in the model. Standard errors in parentheses. Loan-GDP ratio represents the amount of IMF loans disbursed adjusted for the size of the economy. FDI-GDP ratio represents the amount of Foreign Direct Investments adjusted for the GDP.

As we can see, under the OLS, the majority of explanatory variables are statistically significant, except *Inflation*, *Loan-GDP ratio* and *Contr. of Corruption*. This is not the case with FE method, where *Foreign Direct Investments* is strongly significant

and *Inflation* is significant at a 95% confidence level. When using RE, except the constant term, we have two strongly significant parameters *Ln(FDI-GDP ratio)* and *Quota*s. In all three cases, the *Loan-GDP ratio* variable is hardly exercising any power over the output growth. In terms of signs of the estimated coefficients, they are in line with our expectations. After performing post estimation test of these regressions, results indicate that RE would be more consistent than FE or OLS. Theoretically, this illustrates the lack of linear relationship between explanatory variables and unit-specific effect.

Either way, we would like to test these results using a dynamic model. It will allow us to introduce additional instruments, as lagged differences, which will reveal more information about our data, if compared with a static model.

In the following subchapters, we are going to describe our results for each of the three hypotheses and their interpretations.

Low and Middle Income countries and the effect of the IMF loan programs

We modelled our panel data using the system GMM estimator, developed by Blundell and Bond. Our set up incorporates all the variables described in Chapter 3 (except the ones excluded due to high correlation and multicollinearity) and their first lag[10] so that we could identify whether the lagged regressor has more explanatory power than its current one. We declared all variables as predetermined, because we cannot assume strict exogeneity.

After running separate regressions of our dynamic panel models specified above, we obtain the following results.

[10] Except for the instruments that were strongly correlated with their first lag.

Table 7: Dynamic panel estimates for GDP growth

Variable	GDP growth (1)	GDP growth (2)	GDP growth (3)	GDP growth (4)
GDP growth				
L1.	0.0605	0.05425	0.0605	0.0543
	(0.062)	(0.062)	(0.062)	(0.062)
Inflation				
--.	0.0024	0.0013	0.0024	0.0013
	(0.006)	(0.006)	(0.006)	(0.006)
L1.	-0.0012***	-0.0011***	-0.0012***	-0.0011***
	(0.000)	(0.000)	(0.000)	(0.000)
Ln (FDI-GDP ratio)				
--.	1.0132***	0.972***	1.0132***	0.972***
	(0.281)	(0.279)	(0.281)	(0.279)
L1.	-0.2702	-0.2676	-0.2702	-0.2676
	(0.192)	(0.191)	(0.192)	(0.191)
Loan-GDP ratio				
--.	30.3909**	29.1968**	30.3909**	29.1968**
	(13.444)	(13.337)	(13.444)	(13.337)
L1.	6.9023	7.8738	6.9023	7.8738
	(8.976)	(8.889)	(8.976)	(8.889)
Quotas	-0.9705	-0.6887	-0.9705	-0.6887
	(1.404)	(1.377)	(1.404)	(1.377)
Contr. of Corruption	-1.3617**		-1.3617**	
	(0.634)		(0.634)	
Low Income	0.4322	0.4393		
	(0.529)	(0.524)		
Voice & Accountability		-0.9477*		-0.9477*
		(0.541)		(0.541)
Middle Income			-0.4322	-0.4393
			(0.529)	(0.524)
_cons	2.587***	2.8932***	3.0192***	3.3325***
	(0.639)	(0.618)	(0.589)	(0.551)
chi2(10)	59.989	58.744	59.989	58.744
df				
No. of Obs.	397	397	397	397

Notes: The dependent variable is GDP growth rate over the 5-year periods 1970-1974, 1975-1979, …, 2010-2013. A system GMM estimator was applied to the panel data. GMM standard errors are in parentheses. The p-value is reported at a 95% confidence level, where: * p<0.1; ** p<0.05; *** p<0.01. The chi2 represents the Wald Chi-Square statistic with 10 degrees of freedom and represents the number of predictors in the model. L1 represents the first lag of variables. Models were ordered according to numbering in the description of Analytical Models used. Loan-GDP ratio represents the amount of IMF loans disbursed adjusted for the size of the economy. FDI-GDP ratio represents the amount of Foreign Direct Investments adjusted for the GDP.

What we observe is that $Inflation_{t-1}$, $Ln(FDI-GDP\ ratio)_t$, $Loan-GDP\ ratio_t$, $Corruption_t$ and *Constant* term are having a significant effect on the growth level of the economy, while *Voice & Accountability* is significant at a 90% confidence level. A curios fact is that the first lag of the *GDP growth* does not affect the current level of the instrument in a significant matter. We should also note that *Low Income, Middle Income* and *Quotas* are not exercising any significant influence on our dependent variable. In terms of coefficient's sign, majority are in line with our expectations (for $GDP\ growth_{t-1}$, *Inflation*, *Loan-GDP ratio*, $Ln(FDI-GDP\ ratio)_t$, *Low Inc*, *Voice & Accountability* and *Contr. of Corruption*, *Middle Inc*), while *Quotas* and $Ln(FDI-GDP\ ratio)_{t-1}$ are not.

Results show that countries are benefiting from engaging in IMF loan programs - variable $Loan-GDP\ ratio_t$ is both significant and positive in all four models. An increase of one unit in the *Loan-GDP* ratio will increase the *GDP growth* rate with 29.2 to 30.4 percentage points, ceteris paribus. This represents the long-term effect of both the Conditionality and the loans provided by IMF. *FDI* also has a significant effect over the growth of economic output in the current period. Holding other parameters fixed, a 1 % increase in the *FDI-GDP ratio* will increase the *GDP growth* with 0.01 units. Past level of *Inflation* also proved to be significant. An increase of one unit in last period's CPI will decrease the growth of output with 0.001 units, ceteris paribus. Results presented in the table above also suggest that an increase in the rating for *Voice & Accountability* or *Contr. of Corruption* will decrease the economic growth.[11]

When using *estat Abond*, we find no sign of serial correlation in the first-differenced errors, in any of the four models. We cannot reject the null hypothesis of zero autocorrelation at order two;[12] hence, we cannot affirm that our models are misspecified.

[11] Regarding Voice & Account. and Contr. of Corruption, we assume that the higher the rank the more expensive it is for the country to keep its position. Therefore, we believe that the negative signs of the estimated coefficients are caused by higher expenditures for ensuring civil liberties and control of corruption.

[12] We don't take into consideration rejecting the null hypothesis at order one because the first difference of i.i.d. idiosyncratic will be autocorrelated, which does not mean that the model is misspecified.

Table 8: Estat Abond test result – GDP growth

	(1)		(2)		(3)		(4)	
Order	z	Prob > z	z	Prob > z	z	Prob > z	z	Prob > z
1	-2.69	0.007	-2.68	0.007	-2.69	0.007	-2.68	0.007
2	0.473	0.636	0.829	0.407	0.473	0.636	0.829	0.407

Notes: Null hypothesis - no autocorrelation

We also performed the Sargan test to see whether the overidentifying moment conditions are conclusive. The null hypothesis, of valid overidentifying restrictions, could not be rejected for any of the four models. Therefore, we do not need to adjust our models.

Country's quota at IMF and loan size

The second question we want to answer in this thesis is whether the size of the *Quota* of a country can somehow influence the size of the IMF loans. As in the previous subchapter, we will use the system GMM estimator.

As we can see from *Table 9*, except the intercept, no other variable has a significant impact on the size of the IMF Loans. The first lag of *Loan-GDP* ratio is significant at a 90% confidence level. A one percent increase in the Loans received in previous period will increase the current *Loan-GDP* ratio with 0.16 percent, ceteris paribus. Hence, according to our results, we can state that the size of IMF loans is conditioned on the previous history of financing from IMF.

Regarding the signs of estimated coefficients, results for *Contr. of Corruption, Voice & Accountability, FDI-GDP ratio* and *GDP growth* are not in line with our expectations. Even though they are not statistically significant, estimated coefficients suggest that an increase in them will decrease the size of the loans. Even though the estimated coefficient for lagged *Quotas* has a positive sign, it does not affect the size of the loan in a significant way.

Table 9: Dynamic panel estimates for IMF Loan-GDP ratio

Variable	Ln (Loan-GDP ratio) (1)	Ln (Loan-GDP ratio) (2)
Ln (Loan-GDP ratio)		
L1.	0.1623*	0.1584*
	(0.089)	(0.089)
GDP growth		
--.	-0.0243	-0.0155
	(0.039)	(0.039)
L1.	-0.0244	-0.0227
	(0.025)	(0.025)
Inflation		
--.	-0.0045	-0.0011
	(0.007)	(0.007)
L1.	-0.0000	-0.0001
	(0.000)	(0.000)
Ln (FDI-GDP ratio)		
--.	-0.1587	-0.1613
	(0.128)	(0.129)
L1.	-0.1214	-0.0918
	(0.100)	(0.100)
Quotas	0.505	0.3593
	(0.69)	(0.677)
Contr. of Corruption	-0.59	
	(0.370)	
Voice & Accountability		-0.3024
		(0.289)
_cons	-4.7304***	-4.6164***
	(0.560)	(0.537)
chi2(9)	23.055	21.402
df		
No. of Obs.	195	195

Notes: The dependent variable is natural logarithm of Loan-GDP ratio over the 5-year periods 1970-1974, 1975-1979, …, 2010-2013. A system GMM estimator was applied to the panel data. GMM standard errors are in parentheses. The p-value is reported at a 95% confidence level, where: * p<0.1; ** p<0.05; *** p<0.01. The chi2 represents the Wald Chi-Square statistic with 9 degrees of freedom and represents the number of predictors in the model. L1 represents the first lag of variables. Models were ordered according to numbering in the description of Analytical Models used. Loan-GDP ratio represents the amount of IMF loans disbursed adjusted for the size of the economy. FDI-GDP ratio represents the amount of Foreign Direct Investments adjusted for the GDP.

In both cases, Sargan test output indicates that we cannot reject the fact that overidentifying restrictions are valid. In other words, we do not need to revise our model. This is the output from the test:

(1) chi2(81) = 96.924
Prob > chi2 = 0.1095

(2) chi2(81) = 99.647
Prob > chi2 = 0.078

No signs of serial correlation in the first-differenced errors were detected in the second model. For the first model, at AR(1), we cannot reject the null hypothesis at a 95% confidence level and this is a signs that we might have autocorrelation present. In both cases, at AR(2), we fail to reject the null hypothesis of no autocorrelation; therefore, we say that our model is correctly specified.

Table 10: Estat Abond test result – Loan-GDP ratio

	(1)		(2)	
Order	z	Prob > z	z	Prob > z
1	-1.713	0.0868	-1.977	0.0481
2	-0.064	0.9494	-0.356	0.7221

Notes: Null hypothesis - no autocorrelation

IMF loan programs and their effect on Inflation level

In this section, we aim to identify the impact of IMF programs on Consumer Price Index level. Our assumption is that Fund's loans are exercising an upward pressure on Inflation rate. We chose to regress *Low Income* vs *Middle Inc*ome and *Contr. of Corruption* vs *Voice & Accountability* separately due to relatively high correlation between them.

Regression output is displayed in *Table 11*.

The first aspect we notice in the output is highly significant *Constant* variable, first lag of *Inflation* and past and current *FDI-GDP ratio*. In addition to that, *Contr. of Corruption* variable is significant at a 95% confidence level. According to our estimated coefficients, a one percent increase in initial level of CPI will increase the present level of *Inflation* by 0.23 up to 0.24 %, holding other parameters fixed. When it comes to *FDI*, a one percent increase in current *FDI-GDP ratio* will increase the *Inflation* by approximately 0.38%, while a one percent increase of the same instrument in the past period will decrease the level of prices, in the current period, by circa 0.41%, ceteris paribus. *Control of Corruption* exercising a downward pressure on CPI level: a one unit increase in *Contr. of Corruption* will decrease

Inflation by 46%, ceteris paribus. In other words, enforcing anti-corruption measures is determining the level of prices to contract. Estimated coefficient for *Voice & Accountability* also has a negative sign, but it is not statistically significant.

Table 11: Dynamic panel estimates for Inflation rate

Variable	Ln(Inflation) (1)	Ln(Inflation) (2)	Ln(Inflation) (3)	Ln(Inflation) (4)
Ln(Inflation)				
L1.	0.2287***	0.2359***	0.2287***	0.2359***
	(0.050)	(0.050)	(0.050)	(0.050)
Ln(FDI-GDP ratio)				
--.	0.3766***	0.3796***	0.3766***	0.3796***
	(0.093)	(0.094)	(0.093)	(0.094)
L1.	-0.4052***	-0.4083***	-0.4052***	-0.4083***
	(0.054)	(0.054)	(0.054)	(0.054)
Loan-GDP ratio				
--.	2.6506	2.7069	2.6506	2.7069
	(4.923)	(4.979)	(4.923)	(4.979)
L1.	0.3942	0.7354	0.3942	0.7354
	(2.587)	(2.606)	(2.587)	(2.606)
GDP growth	-0.0278	-0.0258	-0.0278	-0.0258
	(0.019)	(0.019)	(0.019)	(0.019)
Quotas	-0.0459	0.0528	-0.0459	0.0528
	(0.422)	(0.422)	(0.422)	(0.422)
Low Income	-0.1459	-0.1337		
	(0.158)	(0.159)		
Contr. of Corruption	-0.4632**		-0.4632**	
	(0.186)		(0.186)	
Voice & Accountability		-0.2205		-0.2205
		(0.163)		(0.163)
Middle Income			0.1459	0.1337
			(0.158)	(0.159)
_cons	1.1982***	1.2827***	1.0523***	1.1490***
	(0.207)	(0.205)	(0.236)	(0.233)
chi2(9)	168.556	162.270	168.556	162.270
df				
No. of Obs.	395	395	395	395

Notes: The dependent variable is natural logarithm of Inflation rate over the 5-year periods 1970-1974, 1975-1979, …, 2010-2013. A system GMM estimator was applied to the panel data. GMM standard errors are in parentheses. The p-value is reported at a 95% confidence level, where: * p<0.1; ** p<0.05; *** p<0.01. The chi2 represents the Wald Chi-Square statistic with 9 degrees of freedom and represents the number of predictors in the model. L1 represents the first lag of variables. Models were ordered according to numbering in the description of Analytical Models used. Loan-GDP ratio

represents the amount of IMF loans disbursed adjusted for the size of the economy. FDI-GDP ratio represents the amount of Foreign Direct Investments adjusted for the GDP.

In regards to the IMF program indicator, *Loan-GDP ratio*, both the first lag and current period estimators have a positive sign. This translates into an upward pressure for the *Inflation* ration. Nevertheless, the impact of this parameter is not statistically significant.

As we described in Section 3.3.3, during our preliminary regression trials, we were having difficulties with finding valid moment conditions. According to Arellano and Bond (1991), the one-step Sargan test over-rejects in the presence of heteroscedasticity. Therefore, we reconsidered our models and applied a natural logarithm transformation to the dependent variable, *Inflation*. We also decided to use a weaker definition of the models, where we include only *GDP growth* (without its first lag) and we assume it is strictly exogenous. Considering the changes applied to our original models, Sargan test results suggest that we cannot reject our hypothesis of valid overidentifying restrictions at a 90% confidence level.

Table 12: Output from Sargan test –Ln(Inflation)

	(1)	(2)	(3)	(4)
chi2(61)	79.992	79.5509	79.992	79.5509
Prob > chi2	0.0519	0.0555	0.0519	0.0555

Notes: H0 = overidentifying restrictions are valid

We believe that in order to obtain valid moment conditions at a 95% confidence level we will have to re-think our model in a more substantial way, by employing a different set of parameters, which can be a subject of further research.

Table 13: Output from Estat Abond test – Ln(Inflation)

	(1)		(2)		(3)		(4)	
Order	z	Prob > z	z	Prob > z	z	Prob > z	z	Prob > z
1	-4.14	0.00	-4.005	0.00	-4.14	0.00	-4.005	0.00
2	0.877	0.380	0.534	0.594	0.877	0.380	0.534	0.594

Notes: Null hypothesis - no autocorrelation

In *Table 13* above, we have the output from *estat Abond* test. For AR(2), we cannot reject the null hypothesis, of zero autocorrelation, which suggests that there is no evidence that our models are misspecified.

5. Conclusion

The International Monetary Fund, over the years, has proved itself as a "lender of the last resort" for countries in economic troubles. The lack of alternative options, in matter of financing an unexpected budget deficit or fixing a balance of payment problem, has forced many governments to engage, willy-nilly, in financial assistance programs, without considering the effects of the conditionality, tied to the funds provided.

In the present study, we have examined economic performance of countries, namely their GDP and Inflation rate, and how IMF's programs are affecting it. In addition to that, we looked at how the size of IMF Quotas contribution can influence the size of the loan received.

When it comes to the total drawings on the General Resources Account of the Fund, our regression found significant evidence that contracting an IMF loan will increase the rate of GDP growth within the five-year period, but not for longer periods, as confirmed by the lack of statistical significant estimates for the first lag of *Loan-GDP ratio*. In other words, in the medium term IMF programs have a positive effect on the economic output growth. Regression estimates for *Low* and *Middle Income* variables confirm our expectations. Nevertheless, they are not statistically significant; hence, we cannot say what kind of impact Fund's programs has on countries from each of these income categories. Our results contradict the previous studies, from Barro & Lee (2005) and Axel Dreher (2006), which found a substantial inverse relation between IMF loan-GDP ratio and economic growth. Our results also suggest that an increase in the rating for *Voice & Account.* or *Contr. of Corruption* will decrease the GDP growth in a significant way.

When it comes to the share of Quotas at IMF and its influence on the size of the contracted loan, we have inconclusive results. Estimated coefficients of Quotas have a positive influence on the *Loan-GDP* ratio, but it is statistically insignificant. Therefore, we cannot say with certainty if IMF Quotas has any weight in determining

the size of the loans granted. Contemporaneous loan size seems to be influenced only by its past level, at a 10% significance level. Considering our results, we need to employ a different set of parameters in the regression model, which can be a subject to further research. Previous research on this topic, by Barro & Lee (2005), argued that "probability and size of IMF loans were larger when a country had bigger quota, more nationals working on the professional staff, and more political and economic proximity to the United States and the major Western European countries".

Results from the third part of our thesis, presented in *Table 11*, are suggesting that there is no significant relationship between *Loan-GDP ratio* and *Inflation*, even though estimated coefficient's signs suggest and upward pressure on CPI level. *FDI-GDP*'s coefficient signals a positive impact on the level of prices, in the current period, while the first lag has a substantial negative effect on current period *Inflation*. Our results confirm findings in previous studies (Barro & Lee, 2005). Holding other variables fixed, the *Contr. of Corruption* has a significant downward impact on the level of prices. In other words, fighting corruption helps decrease inflation levels.

Bibliography

Arellano, M., & S. Bond (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies 58*: 277–297.

Arellano, M., & O. Bover (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics 68*: 29–51.

Atoyan, R., & Conway, P. (2005). Evaluating the impact of IMF programs: A comparison of matching and instrumental-variable estimators. *Review of International Organizations*, 1(2), forthcoming.

Bandow, D. (1994). The IMF: A record of addiction and failure. In D. Bandow, & I. Va´squez (Eds.), *Perpetuating poverty; The World Bank, the IMF, and the Developing World* (pp. 15–36). Washington, DC: Cato Institute.

Barro, R. J., & Lee, J. W. (2005). IMF-programs: Who is chosen and what are the effects? *Journal of Monetary Economics*, 52, 1245–1269.

Beveridge, W. A., & Kelly, M. R. (1980). Fiscal content of financial programs supported by stand-by arrangements in the upper credit tranches, 1969–78. *IMF Staff Papers*, 27, 205–249.

Bird, G. (1986). Relationships, resource uses and the conditionality debate. In T. Killick (Ed.), *The quest for economic stabilisation, The IMF and the Third World*, Aldershot (pp. 145–182).

Bird, G. (2001). IMF programs: Do they work? Can they be made to work better? *World Development*, 29(11), 1849–1865.

Bird, G. and D. Rowlands (2001). "IMF Lending: How Is It Affected by Economic, Political and Institutional Factors," *Journal of Policy Reform*, 4, 243-270.

Blundell, R., and S. Bond. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics 87*: 115–143

Boockmann, B., and Dreher, A. (2003). The contribution of the IMF and the World Bank to economic freedom. *European Journal of Political Economy*, 19(3), 633–649.

Bordo, M. and H. James (2000). "The International Monetary Fund: Its Present Role in Historical Perspective," NBER Working Paper 7724, June.

Breitung, J. (2000). Nonstationary panels, panel cointegration, and dynamic panels. *Adv Econ, 15(2)*, 161-78.

Choi, I. (2001). Unit root tests for panel data. *Journal of international money and Finance*, 20(2), 249-272.

Davidson, R., & MacKinnon, J. G. (2004). Econometric theory and methods (Vol. 5). New York: *Oxford University Press*. 611-613

Dreher, Axel. (2006). „IMF and Economic Growth: The Effects of Programs, Loans, and Compliance with Conditionality". *World Development* Vol. 34, No. 5, pp. 769–788

Dreher, A., & Walter, S. (2010). Does the IMF Help or Hurt? The Effect of IMF programs on the likelihood and outcome of currency crises. *World Development, 38(1)*, 1-18.

Edwards, M. S. (2001, August). Sticking with yes: domestic institutions and IMF compliance. In *Annual Meeting of American Political Science Association*.

Feldstein, M. (1998). Refocusing the IMF, *Foreign Affairs*, March/April Issue.

Fischer, S. (2001). Address in Moscow. *IMF Survey* 30. 14, July 16, pp. 237–239.

Greene, W. H. (2012). Econometric Analysis, 7th ed. Chapter 11. page 385.

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal, 3(*2), 148-161.

Hardoy, I. (2003). Effect of IMF programmes on growth: A reappraisal using the method of matching. Paper presented at *the European Economic Association, Stockholm*, 20–24 August 2003.

Harris, R. D., & Tzavalis, E. (1999). Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of econometrics, 91(2),* 201-226.

Hedlund, S. (2001). Russia and the IMF: A Sordid Tale of Moral Hazard. *Demokratizatsiya*. 9(1) 104-104. Web. 23 Apr. 2016.

Hutchison, M. M., and Noy, I. (2003). Macroeconomic effects of IMF-sponsored programs in Latin America: Output costs, program recidivism and the vicious cycle of failed stabilization. *Journal of International Money and Finance*, 22(7), 991–1014.

Ikejiaku, B. V. (2008). Africa Debate Crisis and the IMF with a Case of Nigeria: Towards Theoretical Explanations. *J. Pol. & L.*, *1*, 2.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of econometrics*, *115*(1), 53-74.

International Monetary Fund. (2014). *Annual Report of the Executive Board for Financial Year Ended April 30, 2014*, Appendix VI: Financial Statements as of April 30, 2014, page 28. [online] Available at: http://www.imf.org/external/pubs/ft/ar/2014/eng/pdf/a6.pdf. [Accessed: 10th January 2015].

International Monetary Fund. (2014). *Annual Report Of The Executive Board For The Financial Year Ended April 30, 2014*, Chapter 5: Finances, Organization and Accountability, page 65. [online] Available at: http://www.imf.org/external/pubs/ft/ar/2014/eng/pdf/ch5.pdf. [Accessed: 10th January 2015].

International Monetary Fund. (2014). *IMF Conditionality*. [online] Available at: https://www.imf.org/external/np/exr/facts/conditio.htm. [Accessed: 27th December 2014].

International Monetary Fund. (2014). *IMF Executive Directors and Voting Power*. [online] Available at: http://www.imf.org/external/np/sec/memdir/eds.aspx. [Accessed: 10th January 2015].

International Monetary Fund. (2014). *IMF at a Glance*. [online] Available at: http://www.imf.org/external/np/exr/facts/pdf/glance.pdf. [Accessed: 27th December 2014].

International Monetary Fund. (2014). *IMF Quotas*. [online] Available at: https://www.imf.org/external/np/exr/facts/quotas.htm. [Accessed: 27th December 2014].

International Monetary Fund. (2014). *Lending by the IMF*. [online] Available at: https://www.imf.org/external/about/lending.htm. [Accessed: 27th December 2014].

International Monetary Fund. (2014). *Special Drawing Rights*. [online] Available at: http://www.imf.org/external/np/exr/facts/sdr.htm. [Accessed: 27th December 2014].

Joyce, J. P. (2004). The adoption, implementation and impact of IMF programs: A review of the issues and evidence. *Comparative Economics Studies, 46(3)*, 451–467

Kaufmann, D., & Kraay, A. (2002). Growth without governance. *World Bank Policy Research Working Paper*, (2928).

Kaufmann, D., & Kraay, A. (2003). Governance and Growth: Causality which way? Evidence for the World, in brief. *Manuscript. World Bank publication*.

Kaufmann, D. and Kraay, A. and Mastruzzi, M., (2010) The Worldwide Governance Indicators: Methodology and Analytical Issues. *World Bank Policy Research Working Paper No. 5430*. [online] Available at SSRN: http://ssrn.com/abstract=1682130. [Accessed: 16th February 2016].

Killick, T. (1994). Adjustment and economic growth. In J. M. Boughton, & K. S. Lateef (Eds.), *Fifty years after Bretton Woods—The future of the IMF and the World Bank*. Washington, DC: International Monetary Fund and World Bank Group.

Knight, M. and J. Santaella, (1997). "Economic Determinants of IMF Financial Arrangements," *Journal of Development Economics*, 54, 495-526.

Kutner, M. H.; Nachtsheim, C. J.; Neter, J. (2004). *Applied Linear Regression Models* (4th ed.). McGraw-Hill Irwin. 408-410

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, *108*(1), 1-24.

Meltzer, A. H. (2005). Reviving the bank and the fund. *Review of International Organizations*, 1(1), 49–60.

Organisation for Economic Co-operation and Development (2008). *OECD Benchmark Definition of Foreign Direct Investment - 4th Edition*. [online] Available at: http://www.oecd.org/daf/inv/investmentstatisticsandanalysis/40193734.pdf. [Accessed: 27th of January 2016].

Przeworski, A., & Vreeland, J. R. (2000). The effect of IMF programs on economic growth. *Journal of Development Economics*, 62, 385–421.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, 9(1), 86-136.

Santaella, J. A. (1996). Stylized facts before IMF-supported macroeconomic adjustment. *IMF Staff Papers*, 43(3), 502–544.

Stata: Stata manual, xtunitroot - Panel-data unit-root tests. [online] Available at: http://www.stata.com/features/overview/panel-data-unit-root-tests/ [Accessed: 4th of July 2016].

Steinwand, M. C., & Stone, R. W. (2008). The International Monetary Fund: A review of the recent evidence. *The Review of International Organizations, 3(2)*, 123-149.

Stiglitz, J. (2004) "The Post Washington Consensus Consensus" (PDF). *policydialogue.org*. *The Initiative for Policy Dialogue*. [Accessed: 27th of September 2016].

Trichet, J. C. (July 1, 2004). Introductory statement to the semiannual Monetary Policy Report. Federal Reserve Board.

Vaubel, R. (1983). The moral hazard of IMF lending. In A. H. Meltzer (Ed.), *International lending and the International Monetary Fund: A conference in memory of Wilson E. Schmidt* (pp. 65–79). Washington, DC: Heritage Foundation.

Appendix A: Countries included in the analysis

Albania	Algeria	Angola	Antigua Barbuda	Argentina
Armenia	Australia	Austria	Azerbaijan	Bahamas
Bahrain	Bangladesh	Barbados	Belarus	Belgium
Belize	Benin	Bermuda	Bhutan	Bolivia
Bosnia Herzegovina	Botswana	Brazil	Brunei	Bulgaria
Burkina Faso	Burundi	Cabo Verde	Cambodia	Cameroon
Canada	Central African Rep.	Chad	Chile	China
Colombia	Comoros	Congo Dem.Rep.	CongoRep	CostaRica
CotedIvoire	Croatia	Cuba	Cyprus	Czech Rep.
Denmark	Djibouti	Dominica	Dominican Rep.	Ecuador
Egypt	El Salvador	Equat. Guinea	Eritrea	Estonia
Ethiopia	Fiji	Finland	France	Gabon
Gambia	Georgia	Germany	Ghana	Greece
Grenada	Guatemala	Guinea	Guinea Bissau	Guyana
Haiti	Honduras	HongKong	Hungary	Iceland
India	Indonesia	Iran	Iraq	Ireland
Israel	Italy	Jamaica	Japan	Jordan
Kazakhstan	Kenya	Kiribati	KoreaSouth	Kuwait
Kyrgyz Rep.	Lao PDR	Latvia	Lebanon	Lesotho
Liberia	Liechtenstein	Lithuania	Luxembourg	Macao
Macedonia	Madagascar	Malawi	Malaysia	Mali
Malta	Marshall Islands	Mauritania	Mauritius	Mexico
Micronesia	Moldova	Monaco	Mongolia	Morocco
Mozambique	Myanmar	Namibia	Nepal	Netherlands
New Zealand	Nicaragua	Niger	Nigeria	Norway
Oman	Pakistan	Palau	Panama	Pap. New Guinea
Paraguay	Peru	Philippines	Poland	Portugal
Qatar	Romania	Russian Federation	Rwanda	Samoa
San Marino	SaudiArabia	Senegal	Serbia	Seychelles

Sierra Leone	Singapore	Slovak Rep	Slovenia	Solomon Islands
South Africa	Spain	Sri Lanka	StKittsNevis	St Lucia
StVincent Grenadines	Sudan	Suriname	Swaziland	Sweden
Switzerland	Syria	Tajikistan	Tanzania	Thailand
Togo	Tonga	Trinidad Tobago	Tunisia	Turkey
Turkmenistan	Tuvalu	UAE	Uganda	Ukraine
United Kingdom	United States	Uruguay	Uzbekistan	Vanuatu
Venezuela	Vietnam	West Bank Gaza	Yemen	Zambia
Zimbabwe				

Appendix B: Content of Enclosed DVD

There is a DVD enclosed to this thesis, which contains empirical data and Stata source codes.

- Folder 1: Source codes
- Folder 2: Empirical data

Appendix C: Data Diagnostics

Table 14: Stationarity – Fisher type-ADF test (lag 0) - full dataset

VARIABLES	(1) No. of panels	(2) Avg. no. of periods	(3) P	(4) P: p-value	(5) Z	(6) Z: p-value
GDP growth	186	7.89	1606.482	0.00	-20.793	0.0000
Ln(GDPpercap)	185	7.95	599.231	0.00	3.027	0.9988
Inflation	173	7.23	2049.679	0.00	-19.283	0.0000
Ln(Inflation)	173	7.15	744.979	0.00	-5.210	0.0000
FDI-GDP ratio	181	7.38	747.235	0.00	-1.513	0.0652
Loan-GDP ratio	117	7.84	576.027	0.00	-9.610	0.0000
Ln(Loan-GDP ratio)	108	5.30	415.693	0.00	-5.564	0.0000
Quotas	179	7.93	2428.525	0.00	-18.924	0.0000
Large quotas	186	9	19.399	1.00	-0.137	0.4456
Contr. of Corruption	184	3.98	2178.551	0.00	-15.489	0.0000
Voice & Account.	186	4	2276.453	0.00	-16.507	0.0000
Gov. Effectiv.	184	3.98	1506.478	0.00	-8.213	0.0000
Rule of Law	186	4	1897.068	0.00	-10.558	0.0000
Low Income	186	9	58.211	1.00	3.100	0.9990
Middle Income	186	9	107.713	1.00	3.866	0.9999

Notes: Variables in bold are not stationary and have to be either transformed or dropped from the dataset. This is confirmed by the p-value for Z, which is higher than the 5% significance level.

Table 15: Collinearity Diagnostics (excl. Low Inc)[13]

Variable	VIF	SQRT VIF	Tolerance	R- Squared
Ln (GDP per cap)	**4.52**	2.13	0.2211	0.7789
Inflation	1.04	1.02	0.9651	0.0349
Ln(FDI-GDP ratio)	1.17	1.08	0.8571	0.1429
Loan-GDP ratio	1.07	1.04	0.9305	0.0695
Quotas	3.45	1.86	0.2896	0.7104
Large quotas	3.16	1.78	0.3161	0.6839
Contr. of Corruption	**4.98**	2.23	0.2006	0.7994
Voice & Account.	2.36	1.54	0.4236	0.5764
Gov. Effectiveness	**5.21**	2.28	0.1921	0.8079
Rule of Law	**5.63**	2.37	0.1776	0.8224
Middle Income	3.75	1.94	0.267	0.733
Mean VIF	3.3			

Notes: Variance Inflation Factor, or VIF, measures the degree of inflation of variance of the estimated coefficients as compared to the case when variables are not linearly related (Kutner, 2005). A VIF value larger than 10 is an indicator of multicollinearity. In addition to that, Squared VIF reveals the degree of ”inflation” of the standard error for the instrument’s coefficient, compared to the event when the variable were not correlated with another one, in the data set. VIF values highlighted are the cause of multicollinearity in our dataset.

Table 16: Collinearity Diagnostics (excl. Middle Inc)[14]

Variable	VIF	SQRT VIF	Tolerance	R- Squared
Ln (GDP per cap)	**4.52**	2.13	0.2211	0.7789
Inflation	1.04	1.02	0.9651	0.0349
Ln(FDI-GDP ratio)	1.17	1.08	0.8571	0.1429
Loan-GDP ratio	1.07	1.04	0.9305	0.0695
Quotas	3.45	1.86	0.2896	0.7104
Large quotas	3.16	1.78	0.3161	0.6839
Contr. of Corruption	**4.98**	2.23	0.2006	0.7994
Voice & Account.	2.36	1.54	0.4236	0.5764
Gov. Effectiveness	**5.21**	2.28	0.1921	0.8079
Rule of Law	**5.63**	2.37	0.1776	0.8224
Low Income	3.75	1.94	0.267	0.733
Mean VIF	3.3			

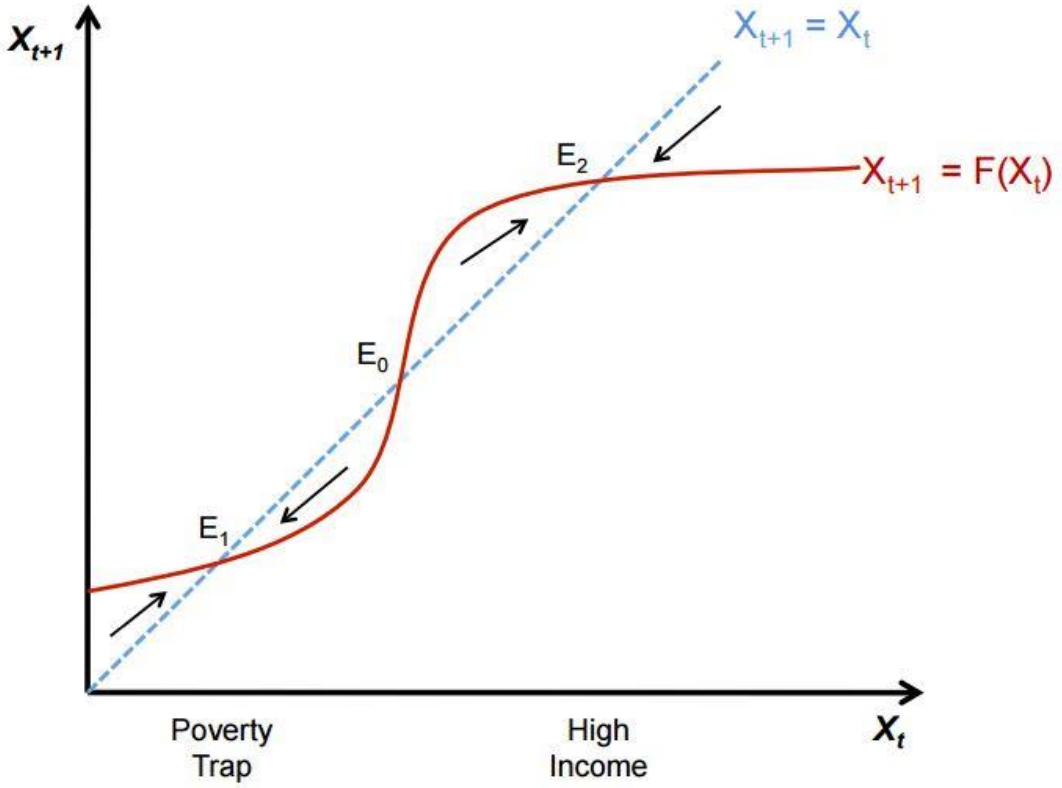
Notes: Variance Inflation Factor, or VIF, measures the degree of inflation of variance of the estimated coefficients as compared to the case when variables are not linearly related (Kutner, 2005). A VIF value larger than 10 is an indicator of multicollinearity. In addition to that, Squared VIF reveals the degree of ”inflation” of the standard error for the instrument’s coefficient, compared to the event when the variable were not correlated with another one, in the data set. VIF values highlighted are the cause of multicollinearity in our dataset.

[13] Low Income dummy was dropped from regression due to collinearity. Therefore, we will perform two separate regressions, where we will exclude one of the two Income dummies.

[14] Middle Income dummy was dropped from regression due to collinearity. Therefore, we will perform two separate regressions, where we will exclude one of the two Income dummies.

Appendix D: Poverty trap

Figure 4: Poverty trap representation



Appendix E: Correlation matrix

1) Excel data analysis

	GDP growth	Ln GDP per cap	Inflation	Ln FDI-GDP	Loan-GDP	Quotas	Large quotas	Contr. Corrupt	Voice & Account.	Gov. Eff.	Rule of Law	Low Income	Middle Income
GDP growth	1												
Ln GDP per cap	-0.068	1											
Inflation	-0.239	-0.08	1										
Ln FDI-GDP	0.187	0.207	-0.141	1									
Loan-GDP	-0.057	-0.168	0.001	-0.015	1								
Quotas	-0.043	0.297	-0.021	-0.098	-0.076	1							
Large quotas	-0.059	0.334	-0.02	-0.064	-0.075	0.59	1						
Contr. Corrupt	-0.205	0.772	-0.135	0.119	-0.072	0.311	0.331	1					
Voice & Account.	-0.276	0.644	-0.137	0.088	-0.002	0.234	0.280	0.767	1				
Gov. Eff.	-0.193	0.818	-0.132	0.114	-0.118	0.348	0.380	0.937	0.775	1			
Rule of Law	-0.213	0.786	-0.159	0.103	-0.088	0.310	0.309	0.935	0.829	0.930	1		
Low Income	0.031	-0.790	0.045	-0.157	0.159	-0.190	-0.215	-0.493	-0.491	-0.539	-0.549	1	
Middle Income	0.027	0.244	-0.007	0.106	-0.158	-0.015	0.003	-0.169	0.006	-0.140	-0.103	-0.730	1

2) Stata

	GDP growth	Ln GDP per cap	Inflation	Ln FDI-GDP	Loan-GDP	Quotas	Large quotas	Contr. Corrupt	Voice & Account.	Gov Eff	Rule of Law	Low Inc	Middle Inc
GDP growth	1												
Ln GDP per cap	-0.158	1											
Inflation	0.003	-0.093	1										
Ln FDI-GDP	0.173	0.281	0.031	1									
Loan-GDP	0.063	-0.184	0.019	0.090	1								
Quotas	0.131	0.186	-0.004	-0.093	-0.056	1							
Large quotas	0.066	0.153	-0.017	-0.073	-0.052	0.802	1						
Contr. Corrupt	-0.067	0.497	-0.14	0.183	-0.08	0.022	0.037	1					
Voice & Account.	-0.19	0.464	-0.129	0.211	-0.015	-0.044	0.062	0.658	1				
Gov. Eff.	-0.004	0.589	-0.117	0.17	-0.129	0.207	0.148	0.837	0.637	1			
Rule Law	-0.053	0.49	-0.161	0.181	-0.094	0.055	0.015	0.862	0.707	0.842	1		
Low Inc	0.127	-0.85	0.076	-0.178	0.160	-0.156	-0.085	-0.445	-0.392	-0.516	-0.447	1	
Middle Inc	-0.127	0.85	-0.076	0.178	-0.160	0.156	0.085	0.445	0.392	0.516	0.447	-1.00	1